

Presentation Conversation Imparts Agency to Human-Machine Interaction

Graduate Graphic Design Studio II — NC State February 2022

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Designing for Conversation Conversation Imparts Agency to Human-Machine Interaction

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Designing for Conversation

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Designing for Conversation 1. Digital Distortions

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Pandemics

The word "pandemic" comes from "all" and "people"—something negative that affects everyone in our community.

Pandemics

The word "pandemic" comes from "all" and "people"— something negative that affects everyone in our community.

The Internet and digital devices connect to 4 billion people. "Today's AI" is inside technology we touch every day.

Pandemic of "Today's Al"

The word "pandemic" comes from "all" and "people"—something negative that affects everyone in our community. The Internet and digital devices connect to 4 billion people. "Today's Al" is inside technology we touch every day. Today's Al foments polarization, pushes irrelevant products, spreads social bias, and surveils our lives.

Pandemic of "Today's Al"

The word "pandemic" comes from "all" and "people"—something negative that affects everyone in our community. The Internet and digital devices connect to 4 billion people. "Today's Al" is inside technology we touch every day. Today's Al foments polarization, pushes irrelevant products, spreads social bias, and surveils our lives. Its impact on our daily living is growing every day.

Pandemic of "Today's Al"

Facebook & Instagram

Google & Youtube

Amazon

Twitter

Artificial Intelligence Inside (TM)

Artificial Intelligence Inside (TM)

FaceSool & Instagram
Google & Years of Amazon

Twitter

m CODE =

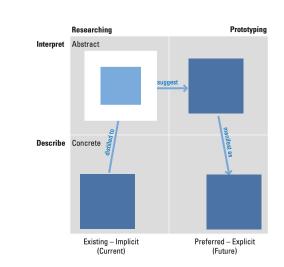
DATE MATION =

CODIFICATION

Artificial Intelligence Inside (TM) Pandemic of "Today's AI" = "Bad AI"

- Manipulation of attention by Internet platforms
- Manipulation of sentiment in politics & elections
- Loss of privacy through "surveillance capitalism"
- Bias in law enforcement algorithms
- Facial recognition leading to social control
- Overpowering of human capacity & "Human Downgrading"
- —Al is making the world we see and the world we live in.
- -Human purpose is lost.

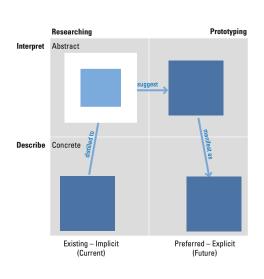
Premise—It's the "Digital Culture"



Digital technology forges a culture focused primarily on what computers can easily do. Most often for profit.

Values inherent in the code of Today's Al are so often at odds with being human.

Assumptions from Digital Culture



Digital Culture assumes:

interaction is mechanistic

information is objective

 intelligence is a process that sits inside a person or computer

So it "it becomes true" that:

- human behavior can be generalized and accurately predicted
- the same option offered at an interface has the same meaning for everyone
- machine prediction is intelligent—so the machine's selection need not be questioned or tested by the human

EXAMPLES

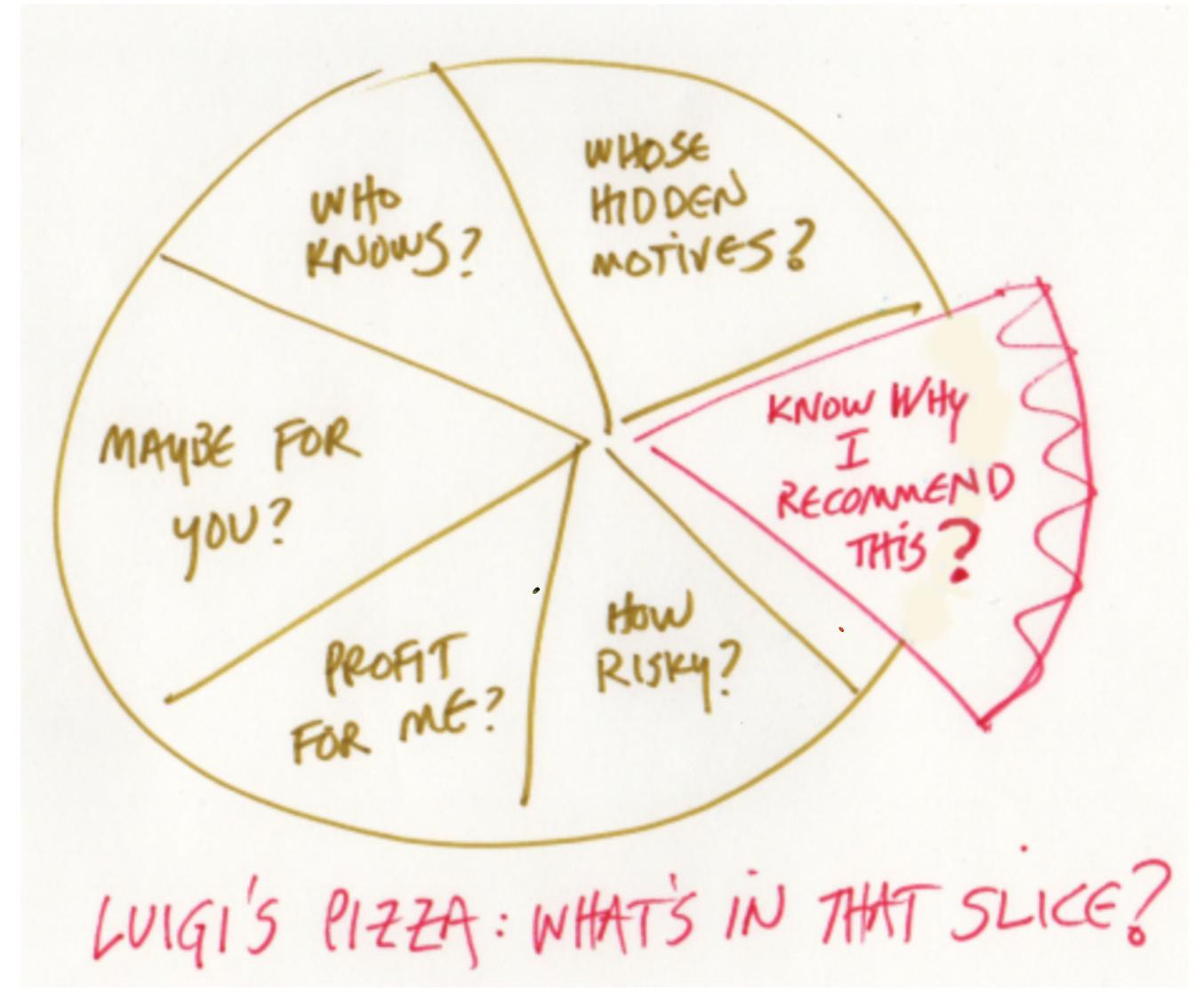
- Google "Page Rank" Lack of Transparent Intent
 You cannot learn why choices were offered
- Youtube "Up Next"—Asymmetry of Control of Focus
 You cannot question or redirect choices offered
- Facebook "News Feed" Lack of Control of Choice
 You can decline options but not define them

CODE = CODIFICATION

- Lack of Transparent Intent
 You cannot learn why choices were offered
- Asymmetry of Control of Focus
 You cannot question or redirect choices offered
- Lack of Control of Choice
 You can decline options but not define them

CODIFICATION enshrines values that control outcomes

The Parable of Luigi's Pizza

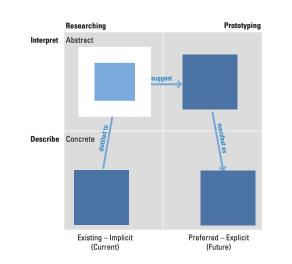


More about Luigi's Pizza

Designing for Conversation 2. Analog Alternatives

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Premise—It's not Technology—not Al itself



Technology itself is not at fault—it is how we fashion it and the traits we embed in it.

In pursuit of profit, we build engines that dazzle our brains and addict us to our human & biological vulnerabilities.

This is not the only option.

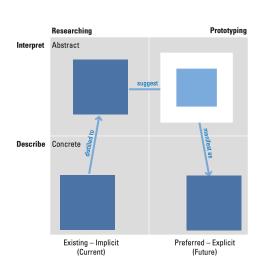
We can shift technology from digital assumptions and swing back toward our analog roots—our physical, organic, biological selves.

Novelty and choice, transparency and conversation can become the new core principles of Today's Al.

Counter

To upset the dominance of the pernicious algorithms of Al, we must design and propagate a set of humane, organic, and analog interactional frameworks.

Countering with analog frameworks



Digital Culture assumes:

interaction is mechanistic

• information is objective

 intelligence is a process that sits inside a person or computer

"Analog frameworks" means:

- interaction can be conversational inviting interpretation & responses from other contexts & understandings
- information can mean the triggering of ideas and reactions—the opening of new possibilities, ideas, & actions
- intelligence can be relational an attribute of an interaction and not something inside a person or a box.

Countering with a preferred future

To upset the dominance of the pernicious algorithms of Al, we must design and propagate a set of humane, organic, and analog interactional frameworks.

If we bring forth replacements for the algorithms of Today's Al, we can begin to have a positive effect and better serve our social fabric.

CODE = CODIFICATION = DIGITAL

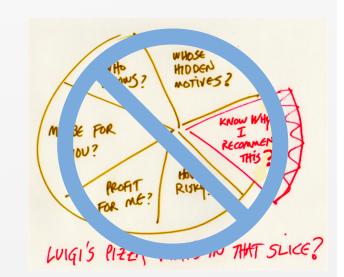
 Lack of Transparent Intent You cannot learn why choices were offered



- Asymmetry of Control of Focus You cannot question or redirect choices offered
- Lack of Control of Choice You can decline options but not define them

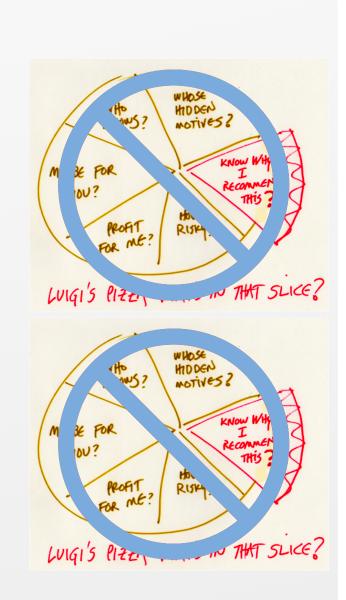
23

Lack of Transparent Intent
 "Why is Luigi's Pizza the best pizza?"



- Asymmetry of Control of Focus
 You cannot question or redirect choices offered
- Lack of Control of Choice
 You can decline options but not define them

- Lack of Transparent Intent
 "Why is Luigi's Pizza the best pizza?"
- Asymmetry of Collaborative Focus
 "Does Luigi's serve gluten-free pizza?"
- Lack of Control of Choice
 You can decline options but not define them



- Lack of Transparent Intent
 "Why is Luigi's Pizza the best pizza?"
- Asymmetry of Collaborative Focus
 "Does Luigi's serve gluten-free pizza?"
- Lack of Collaborative Choice
 "Why might I like this new dish?"



- Transparent Intent
 "Why is Luigi's Pizza the best pizza?"
- Collaborative Focus
 "Does Luigi's serve gluten-free pizza?"
- Collaborative Choice
 "Why might I like this new dish?"

- Transparent Intent
 "Why is Luigi's Pizza the best pizza?"
- Collaborative Focus
 "Does Luigi's serve gluten-free pizza?"
- Collaborative Choice
 "Why might I like this new dish?"

= CONVERSATION = ANALOG

CODE = CONVERSATION = ANALOG

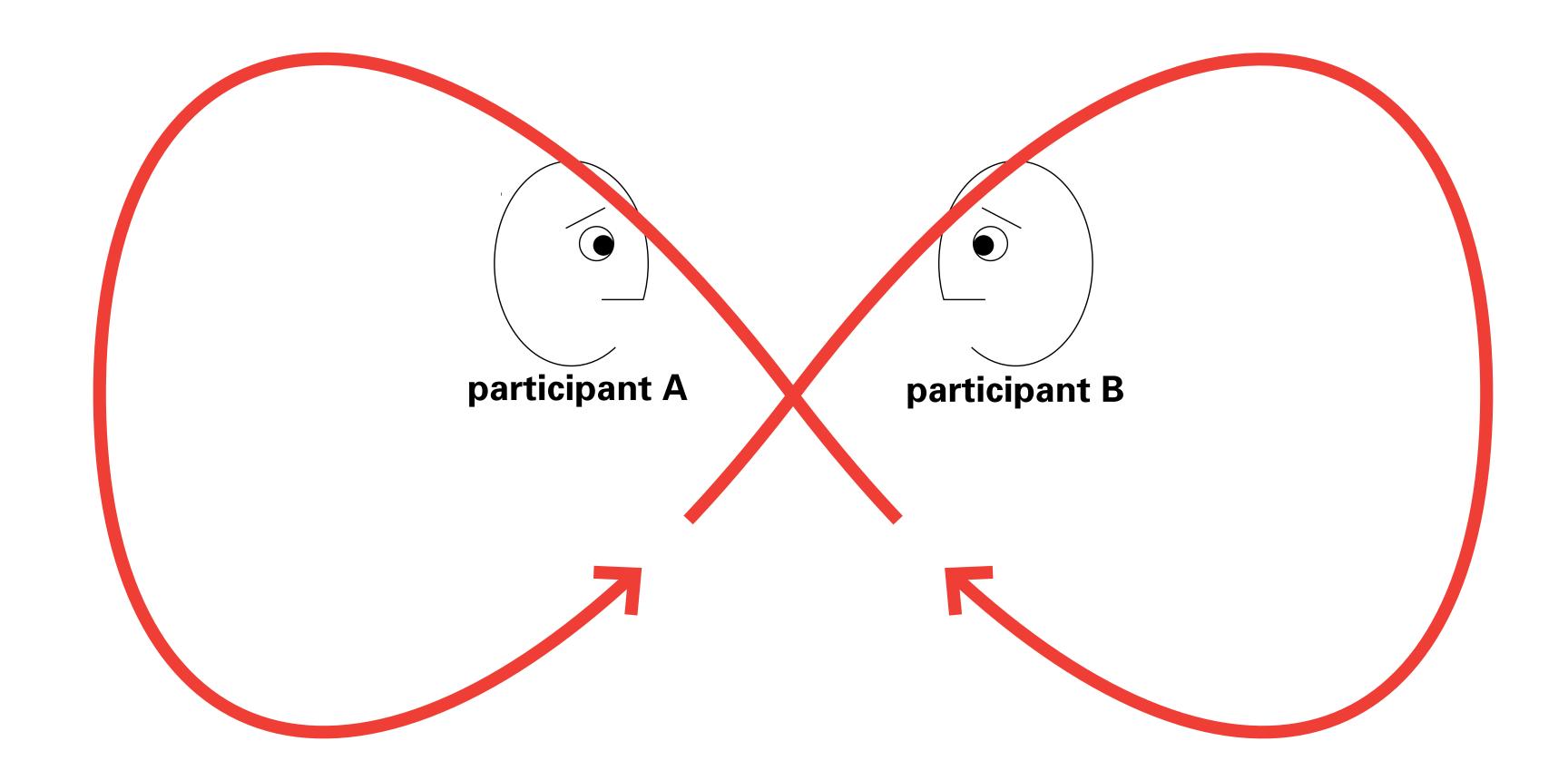
- Transparent Intent
 "Why is Luigi's Pizza the best pizza?"
- Collaborative Focus
 "Does Luigi's serve gluten-free pizza?"
- Collaborative Choice
 "Why might I like this new dish?"

Novelty and choice, transparency and conversation would become the new core principles of interaction.

Designing for Conversation 3. Conversational Interactions

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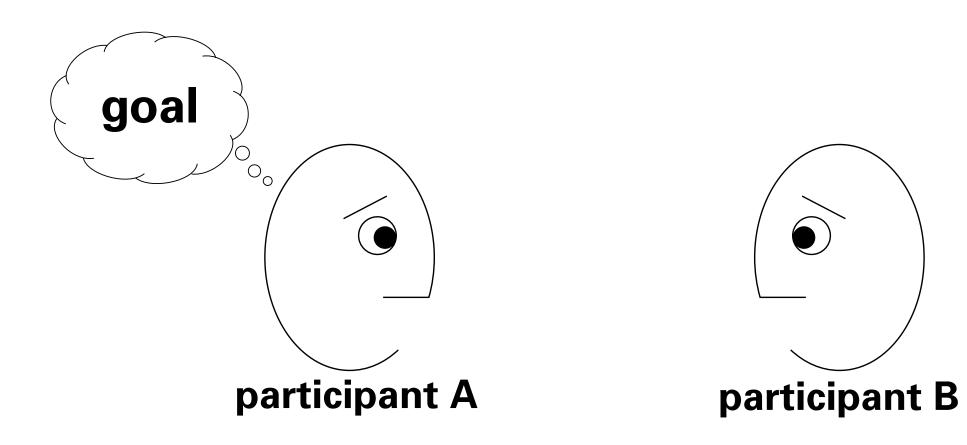
Turning Together



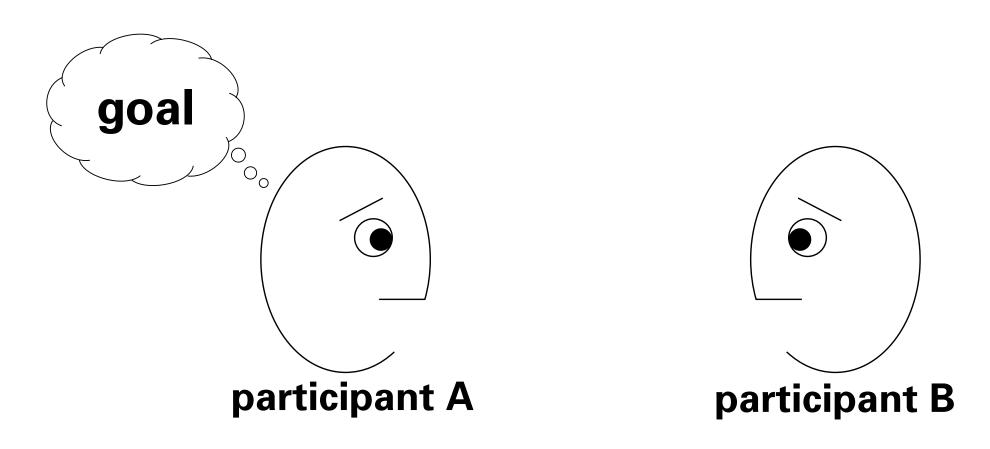
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3131

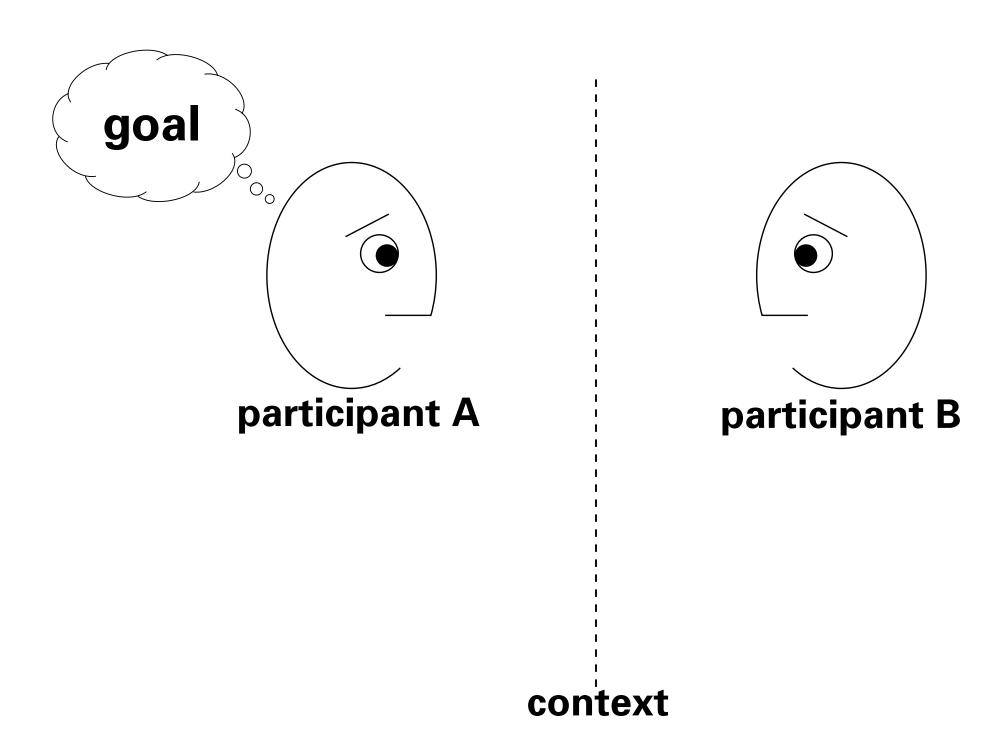
Conversational Frame



A participant has a goal.

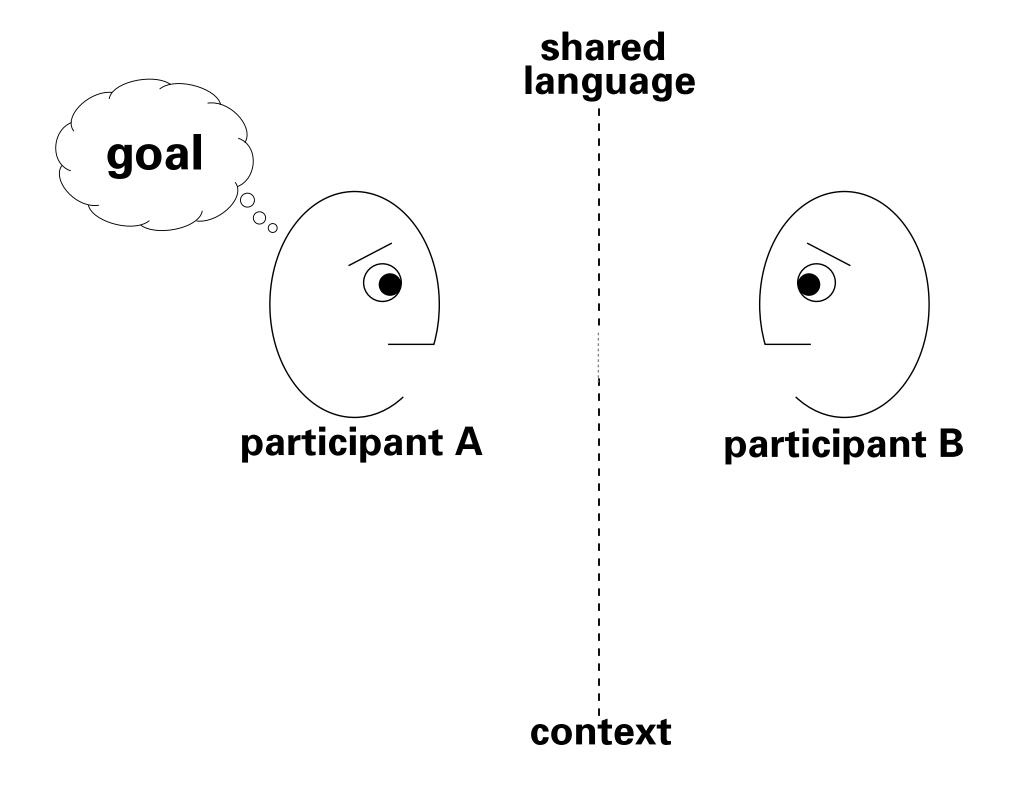


Chooses a context.



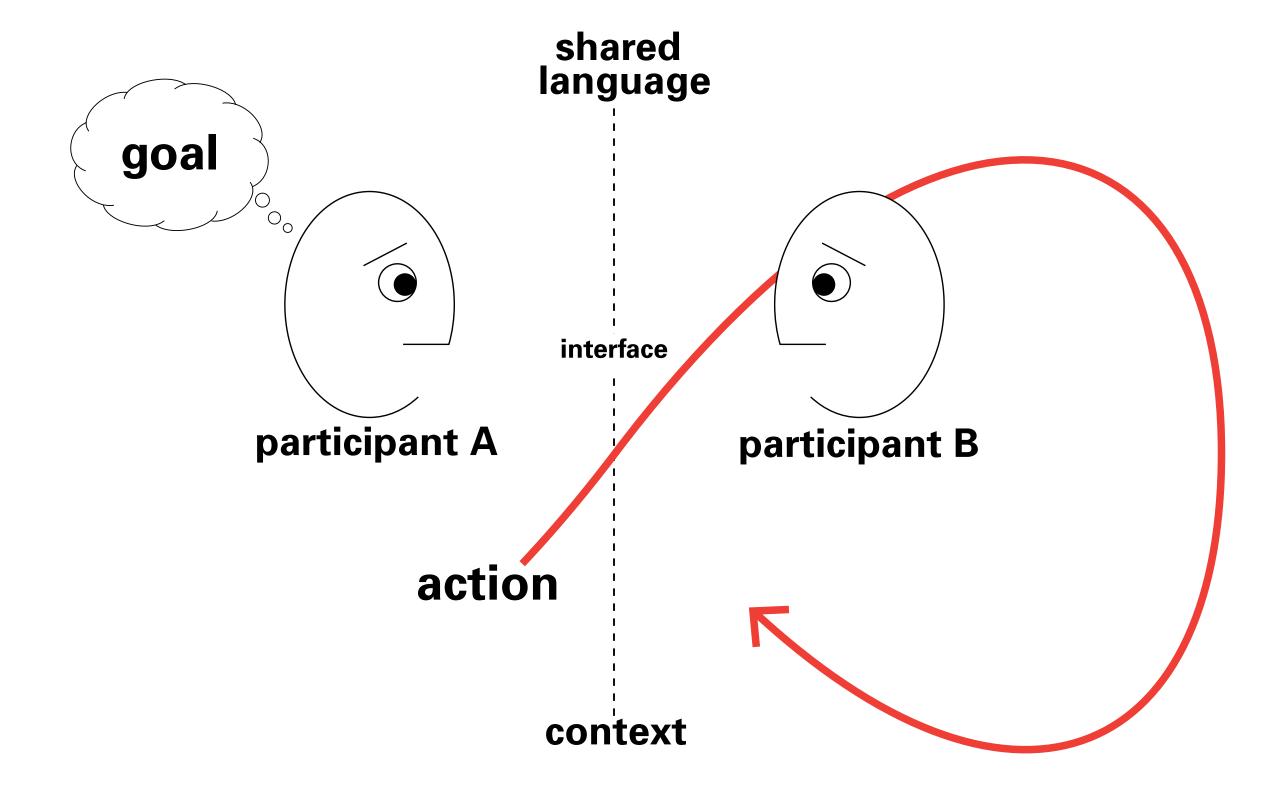
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Chooses a language.



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35³⁵

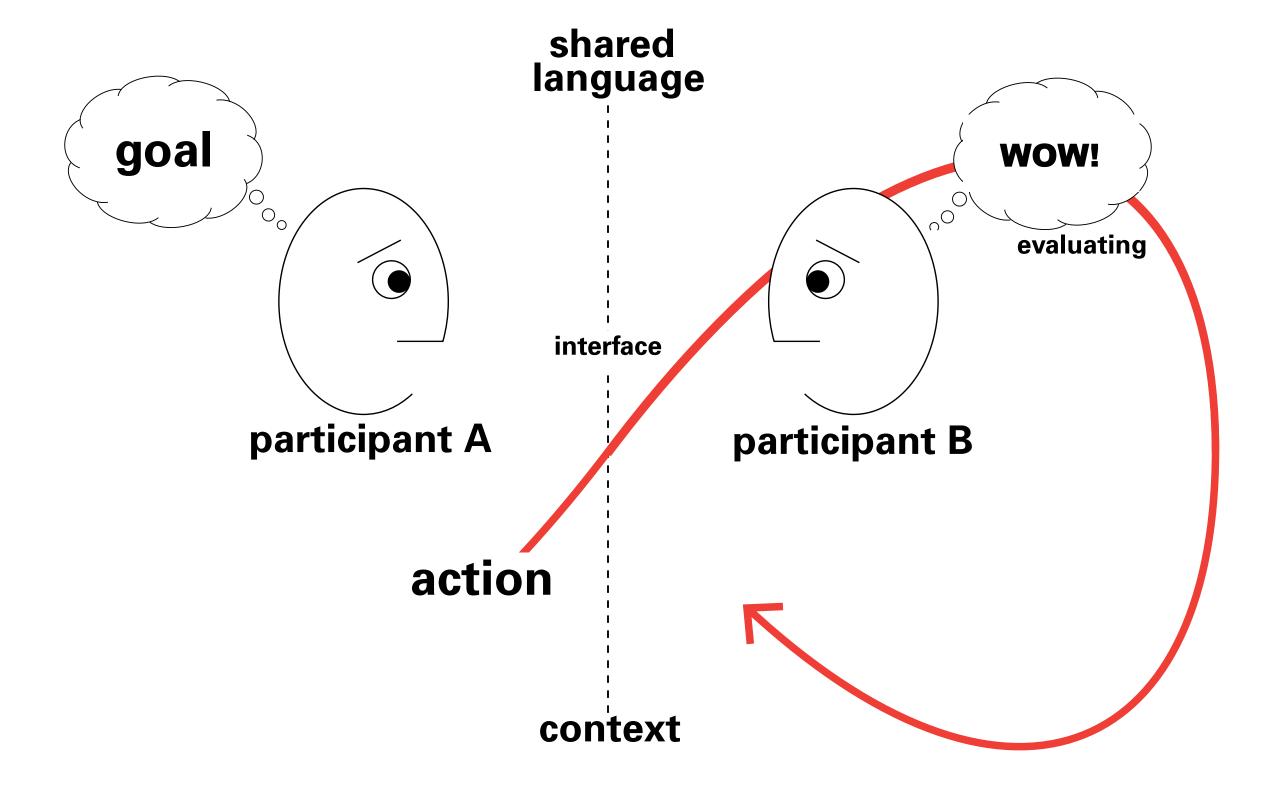
Begins an exchange.



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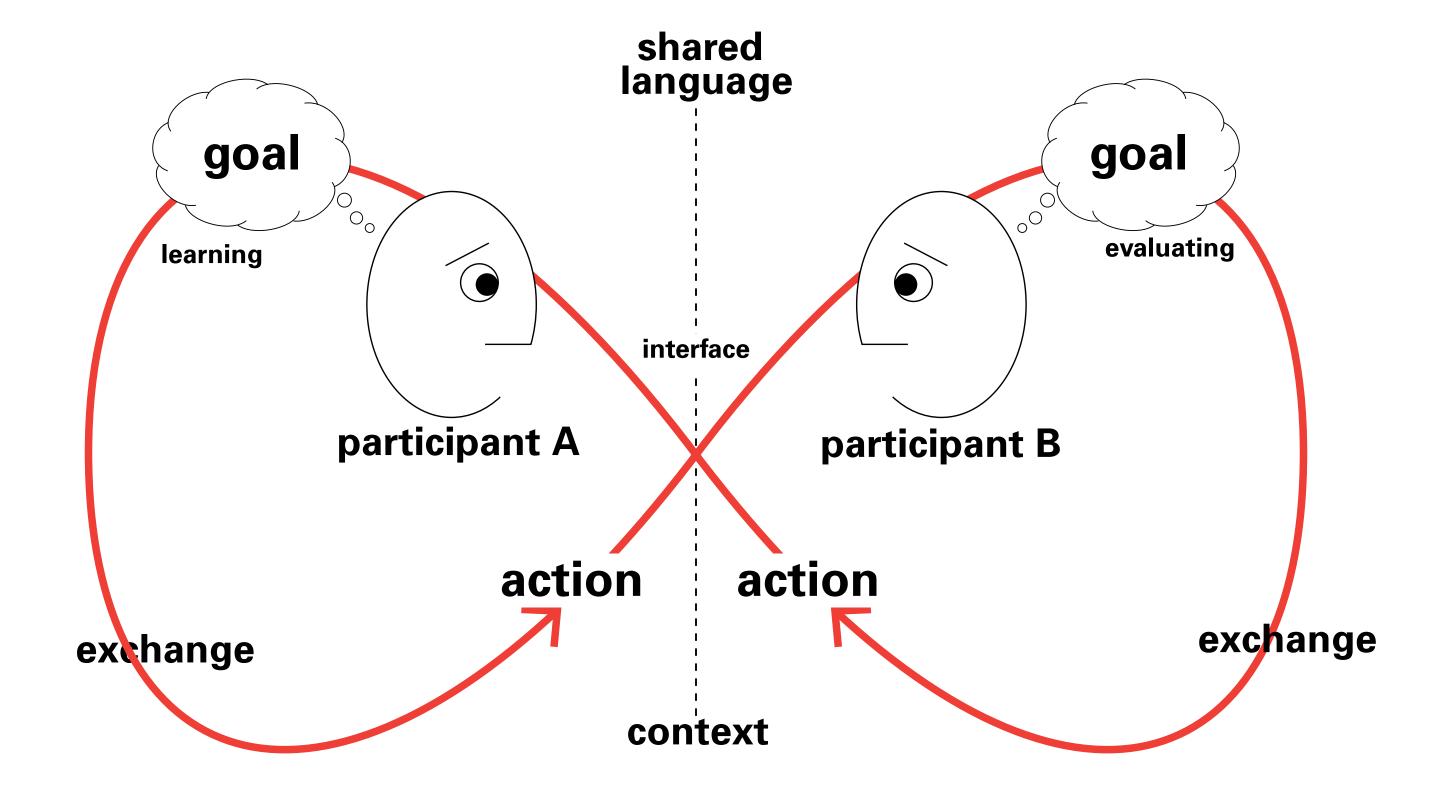
36³⁶

May evoke a response...

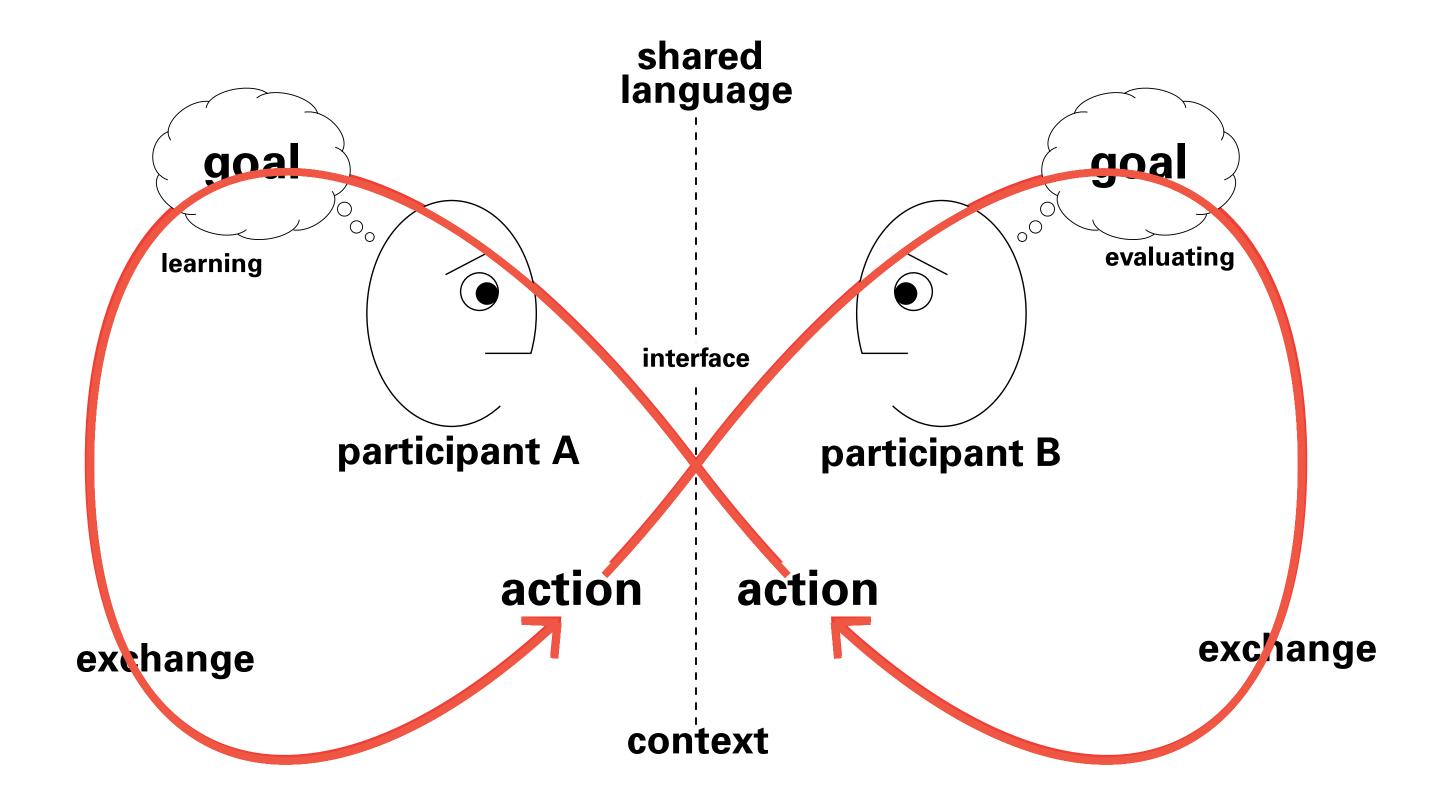


3737

... and a reaction that evokes a reaction...



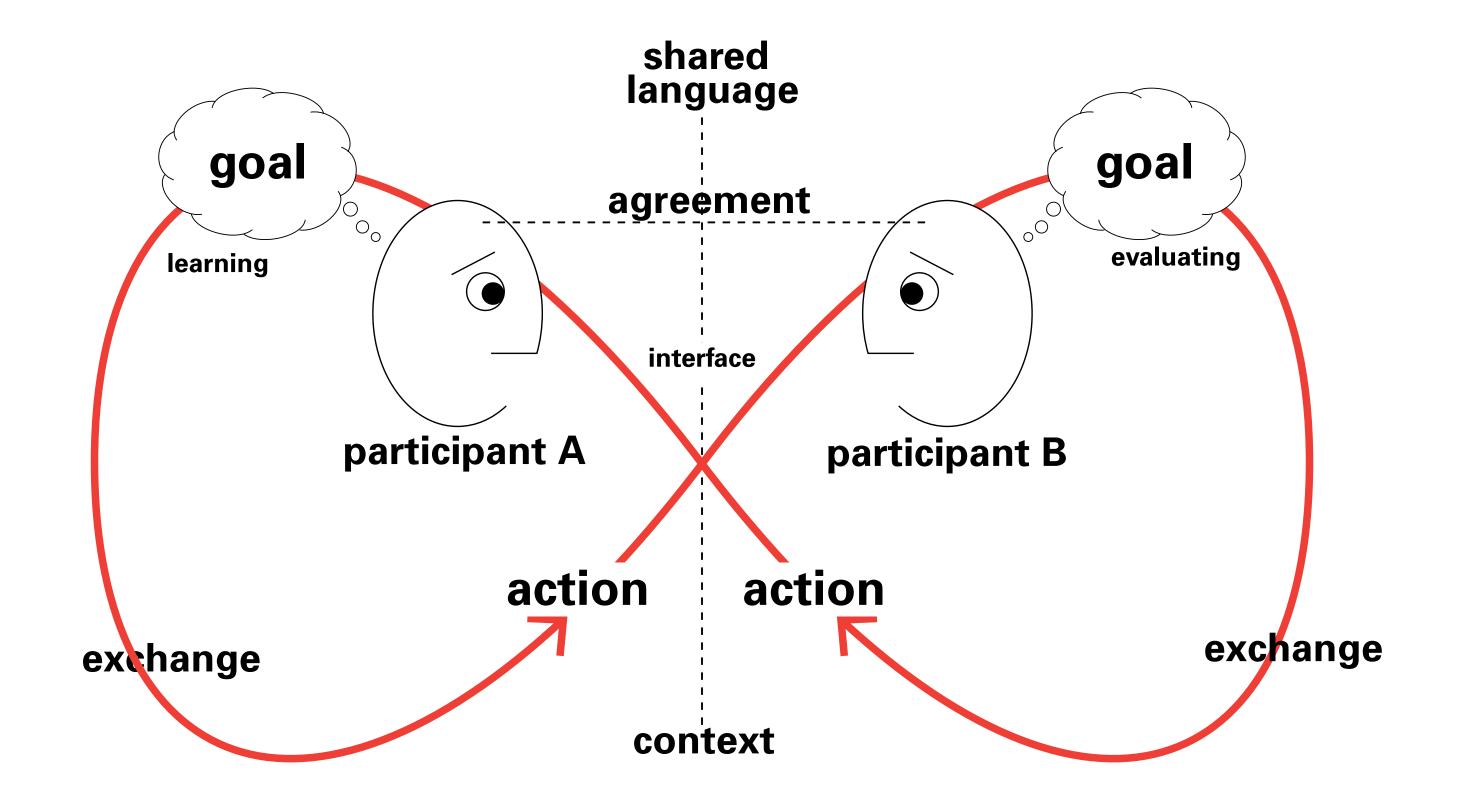
The engagement may continue.



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39³⁹

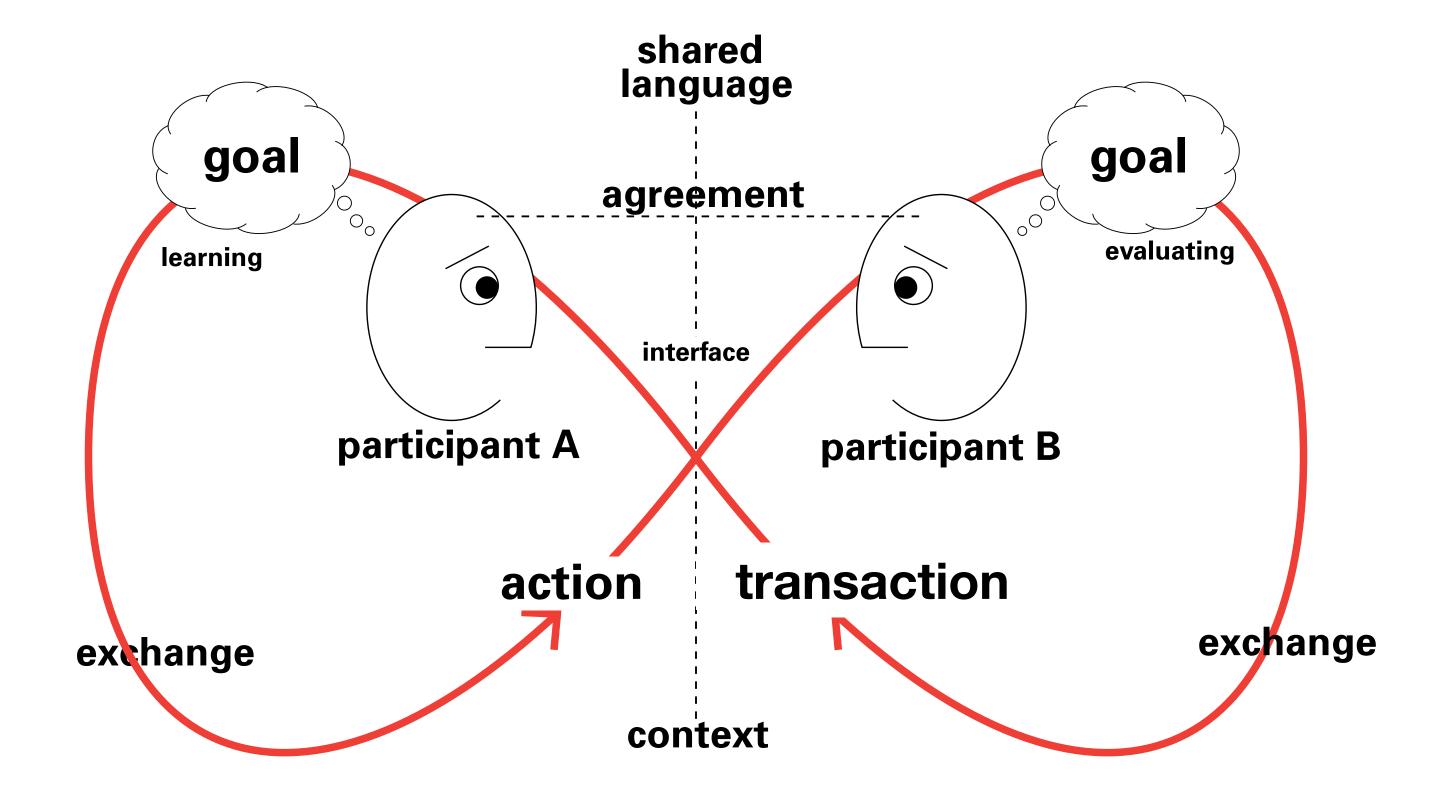
An agreement may be reached.



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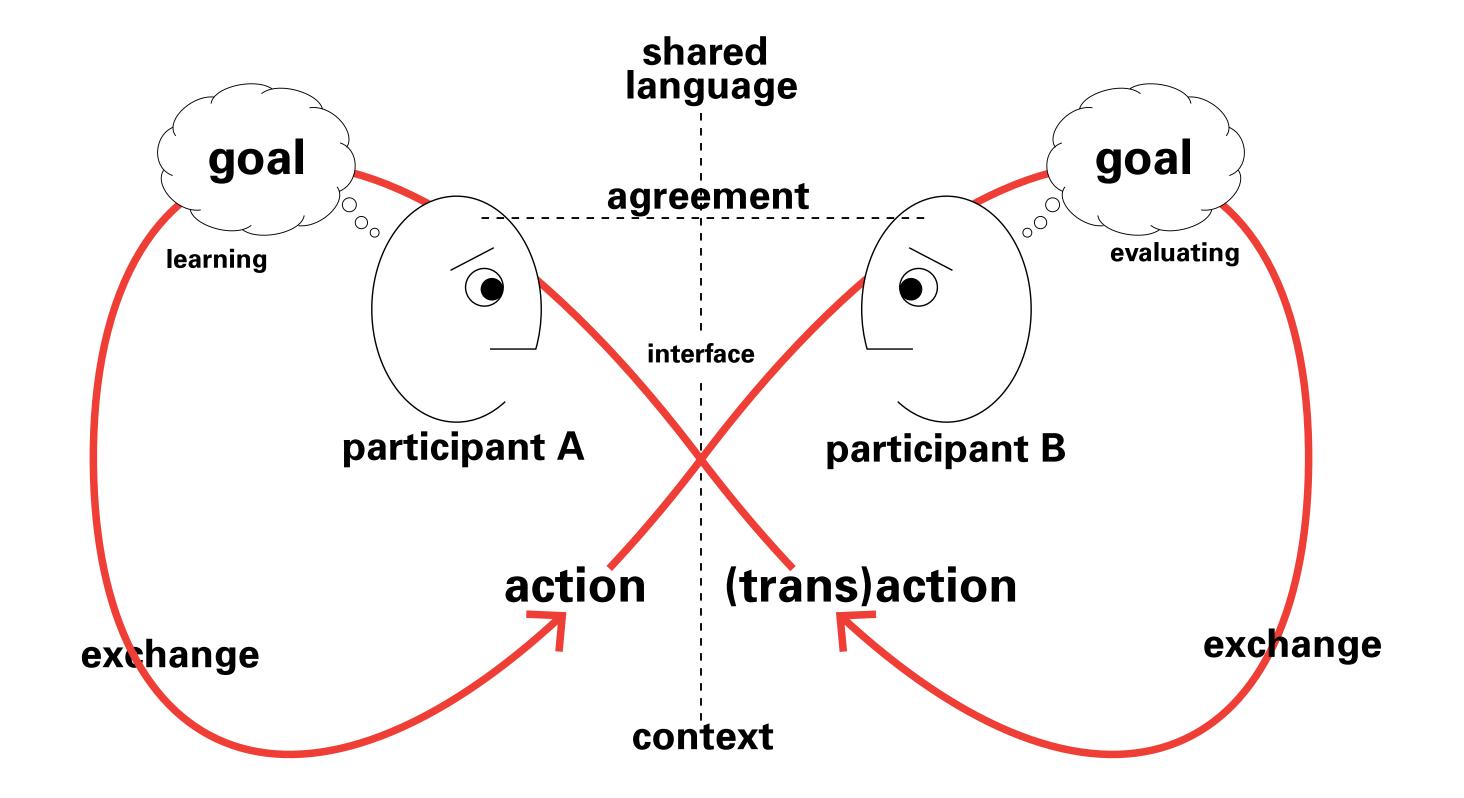
40⁴⁰

A transaction may occur.



after Dubberly Design Office 2008

Conversation Redux



Conversation Redux — C-L-E-A-T

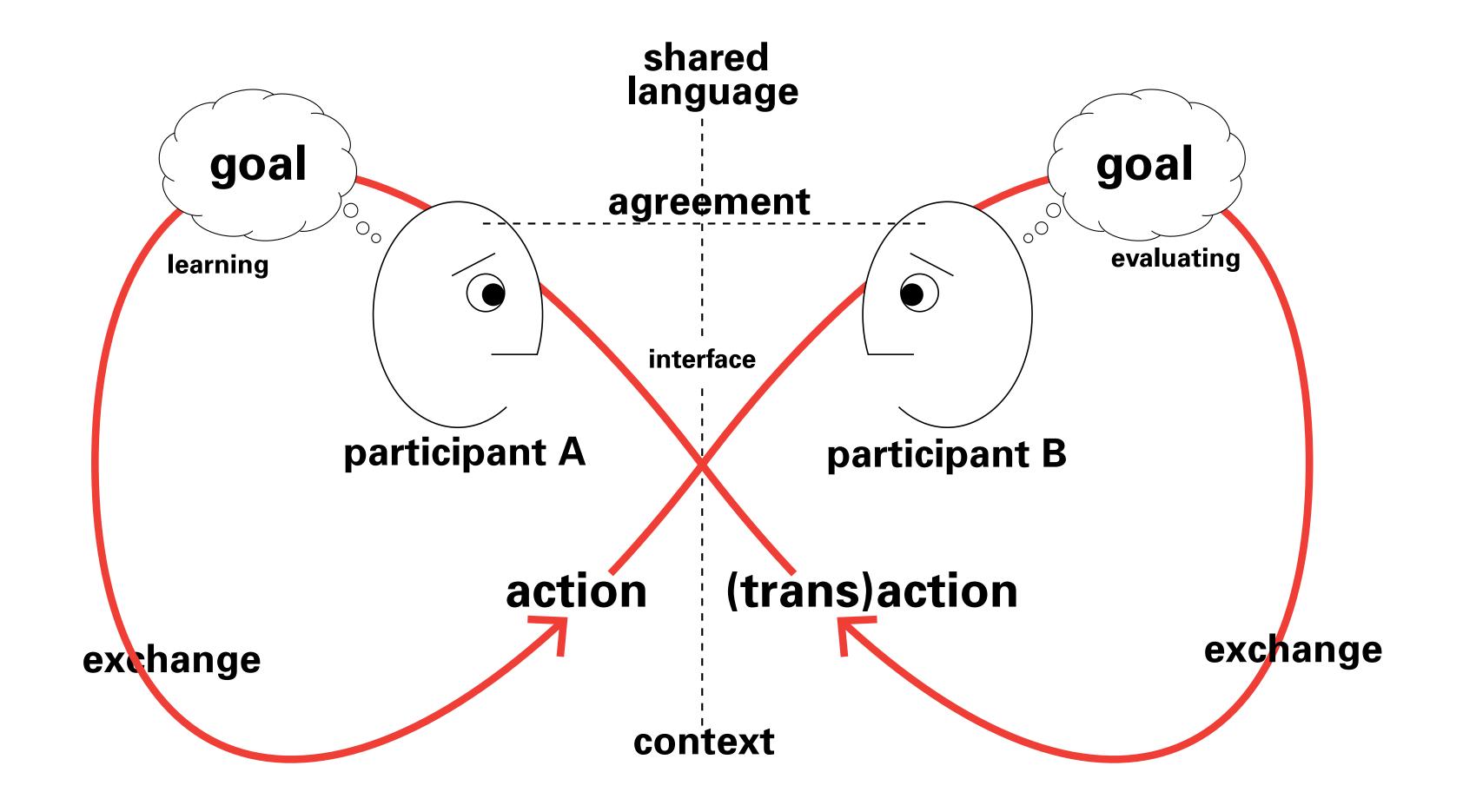
C - Context

L – Language

E – Engagement

A – Agreement

T – Transaction

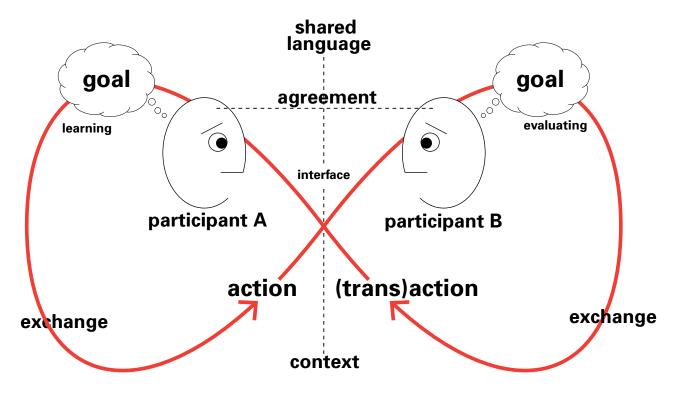


after Gordon Pask

Why does conversation matter?

- · to act together, we must reach agreement
- · to reach agreement, we must have an exchange
- · to hold an exchange, we must have shared language.

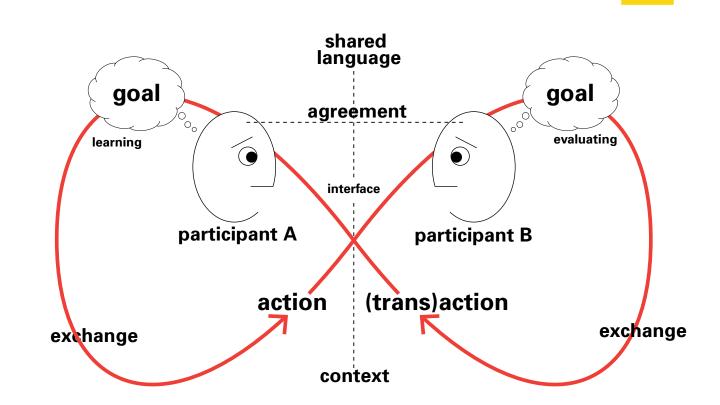
So: to cooperate and collaborate requires conversation.



What may follow from conversation?

- shared history
- relationship
- · trust
- respect
- unity.

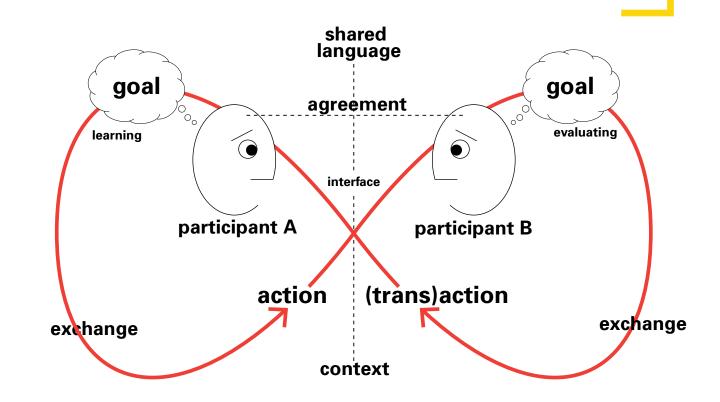
All these require conversation.



What does conversation enable?

- community
- · commerce
- · culture
- government
- · society.

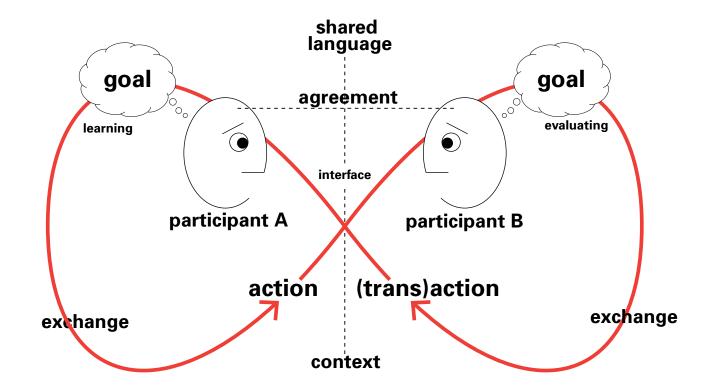
All these demand conversation.



Designing for Conversation

The goal of designing for conversation is to facilitate the emergence of conditions in which others can design—to create conditions in which conversations can emerge—and thus to increase the number of choices open to all.

— Dubberly & Pangaro, Cybernetics and Design: Conversations for Action, 2017



A preferred future

To upset the dominance of the pernicious algorithms of Al, we must design and propagate a set of humane, organic, and analog interactional frameworks.

If we bring forth replacements for the algorithms of Today's Al, we can begin to have a positive effect and better serve our social fabric

... based in conversation.

Bringing about a preferred future Novelty, transparency, and choice in IxD

Goal: To design and integrate new classes of interactional systems with today's Al and digital technologies to create and promote a new category of analog interactional frameworks

... where conversation is primary.

Click for Abstract and Slides

Bilingual Synthesis — Alternatives to Today's Al

DATA-ANIMATED

binary

discrete

deterministic

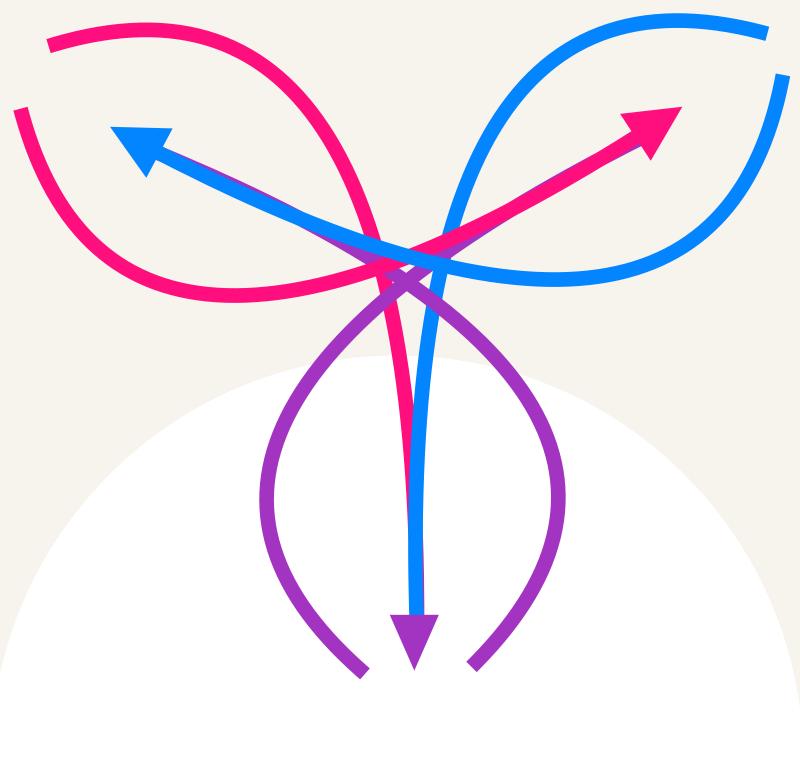
artificial

representational

specific

predictive

transactional



Cybernetics

bilingual sensibility

Digital

SOCIALLY-ANIMATED

biological

fluid

open-ended

organic

resonant

ambiguous

uncertain

conversational

Analog

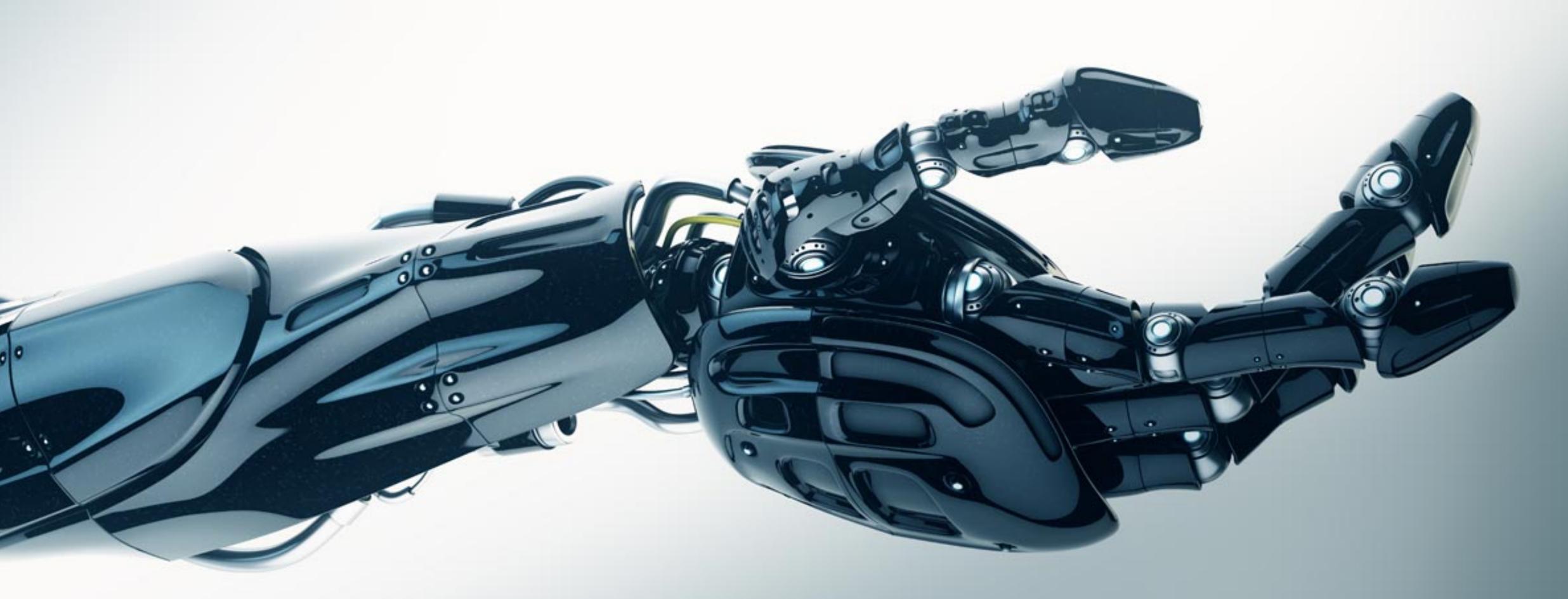
Designing for Conversation 4. Cybernetics

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Cybernetics is not Biomechatronics

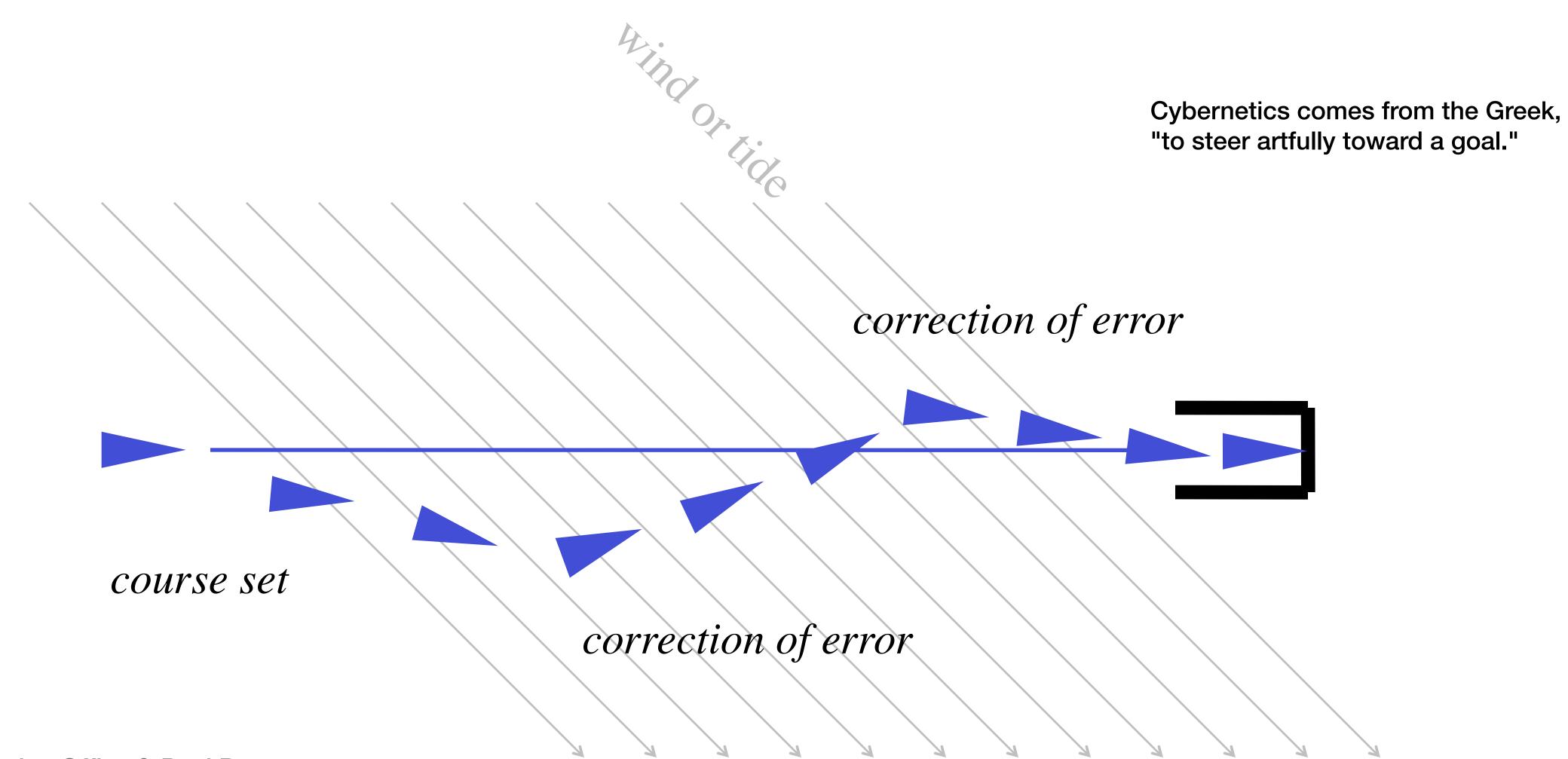


https://carleton.ca/mechatronics/



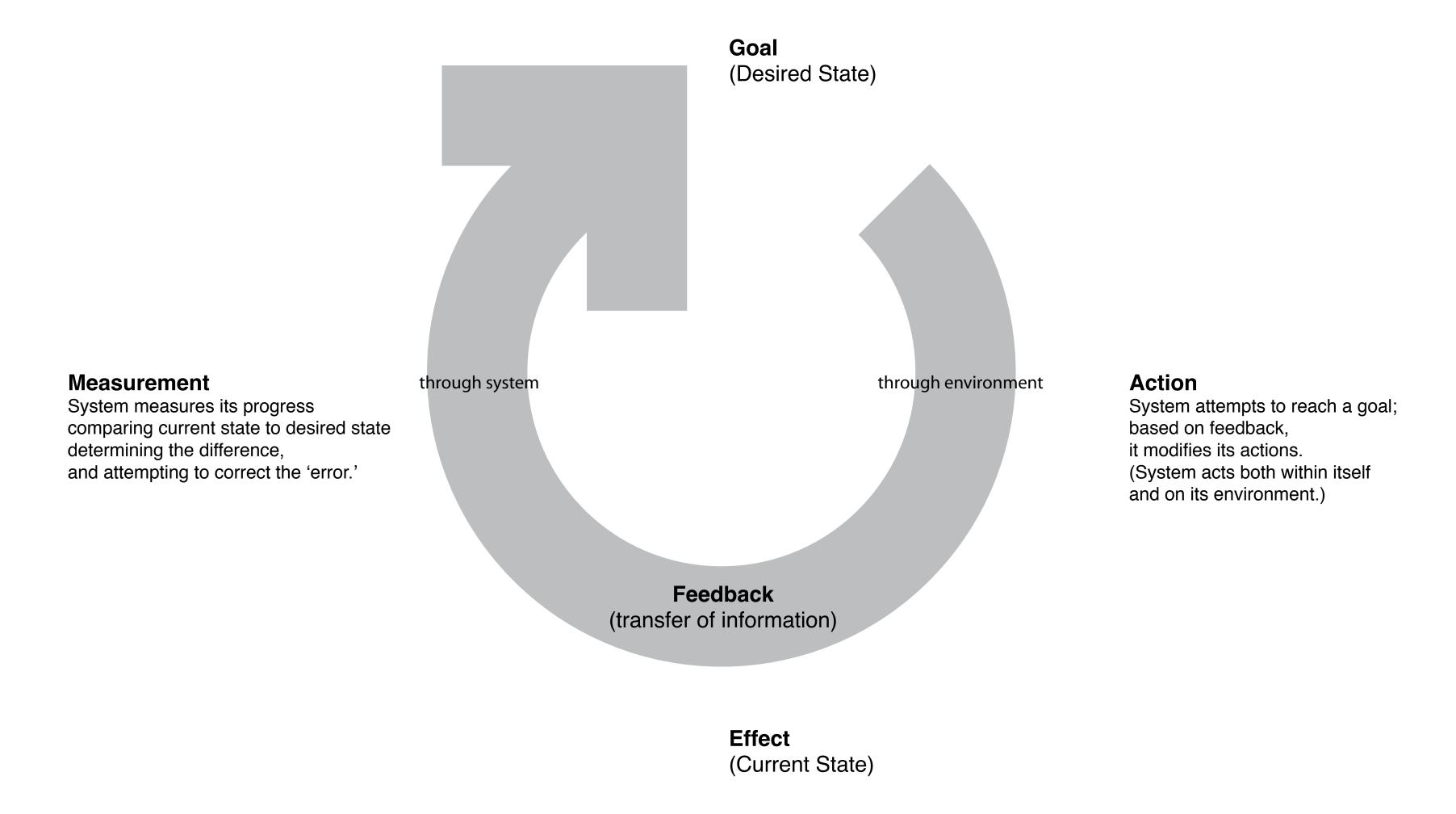
Cybernetics is not Al
Cybernetics is not Biomechatronics
Cybernetics is not Robotics
Cybernetics is not Chips in Your Brain
... and Cybernetics is not Freezing Dead People!

Cybernetics is "the art of steering"



Dubberly Design Office & Paul Pangaro

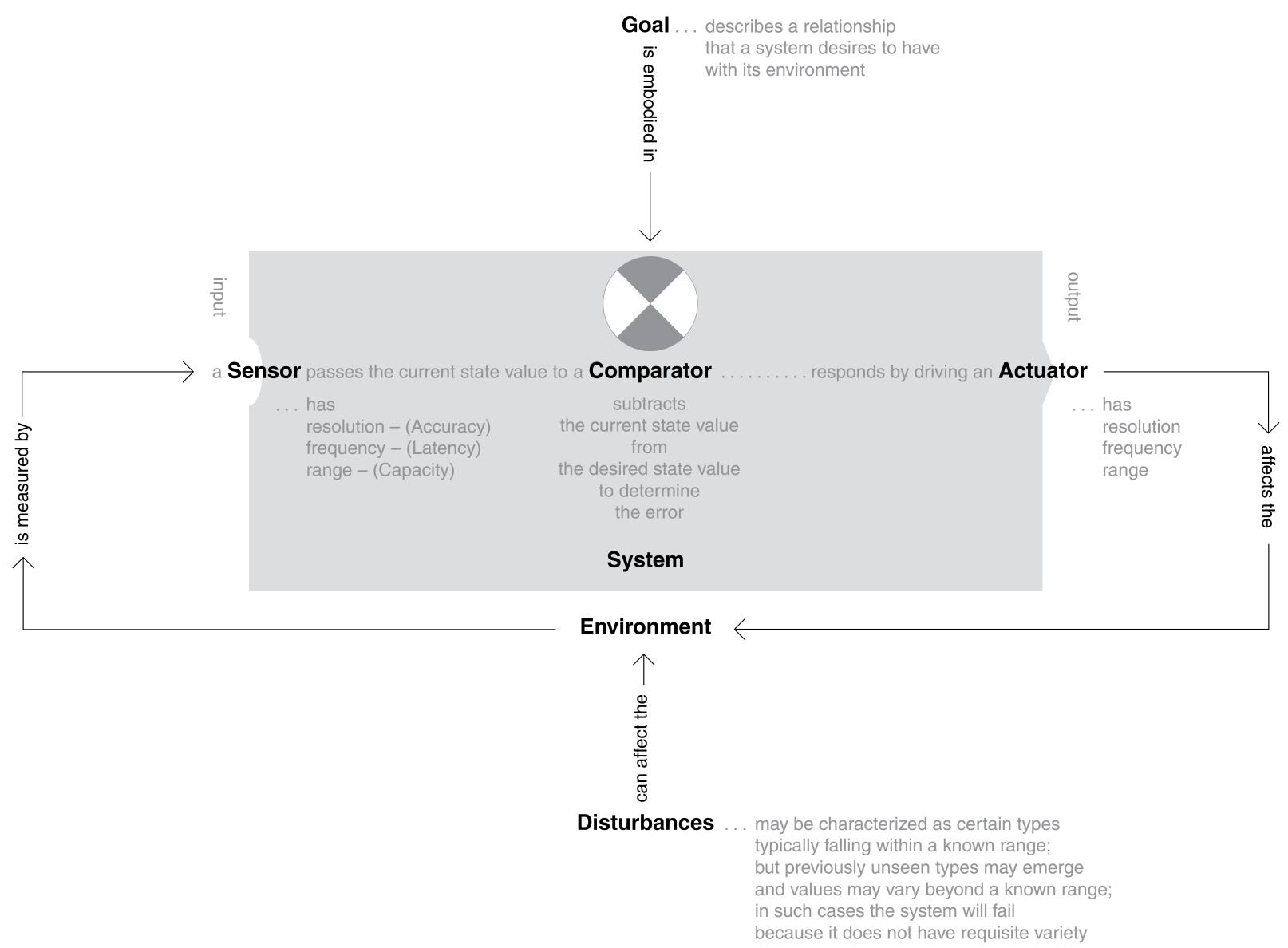
Feedback: Basics



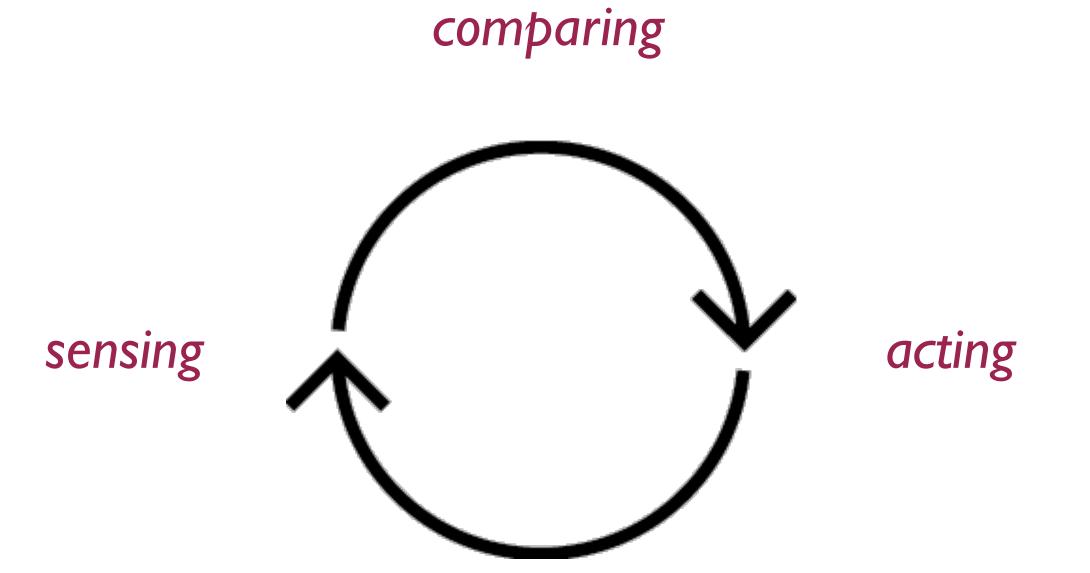
Pangaro | February 2022 January 2010 | Developed by Paul Pangaro and Dubberly Design Office

57

Feedback: Formal Mechanism



Cybernetics is "the art of steering"

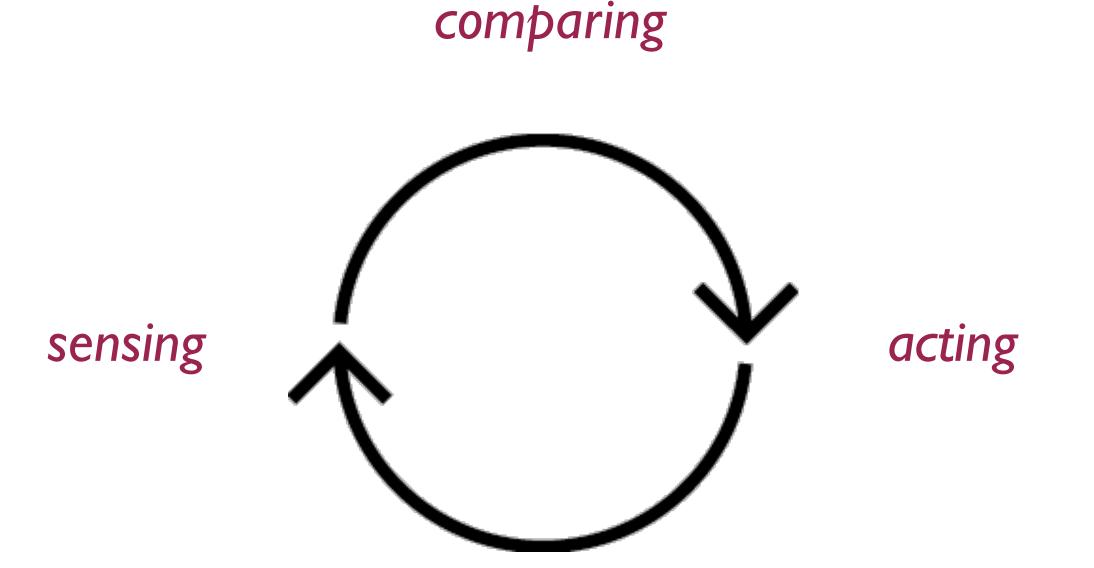


Cybernetics comes from the Greek, "to steer artfully toward a goal."

Cybernetics is the art and science of feedback and goals.

Dubberly Design Office & Paul Pangaro

Cybernetics is about systems with purpose



Cybernetics comes from the Greek, "to steer artfully toward a goal."

Cybernetics is the art and science of feedback and goals.

Dubberly Design Office & Paul Pangaro

LIBRARY

JUN 22 1949

U S PATENT OFFICE

CYBERNETICS

OR CONTROL AND COMMUNICATION IN THE ANIMAL AND THE MACHINE

Norbert Wiener

PROFESSOR OF MATHEMATICS
THE MASSACHUSETTS INSTITUTE
OF TECHNOLOGY

THE TECHNOLOGY PRESS

JOHN WILEY & SONS, INC., NEW YORK
HERMANN et CIE, PARIS

Cybernetics is the title of a book published in 1948 by Norbert Wiener.

It is partially the subtitle that refers to "animal" and "machine" in the same phrase that led to confusion with robots and Al.

Norbert Wiener Mathematician

Author of *Cybernetics* 1948

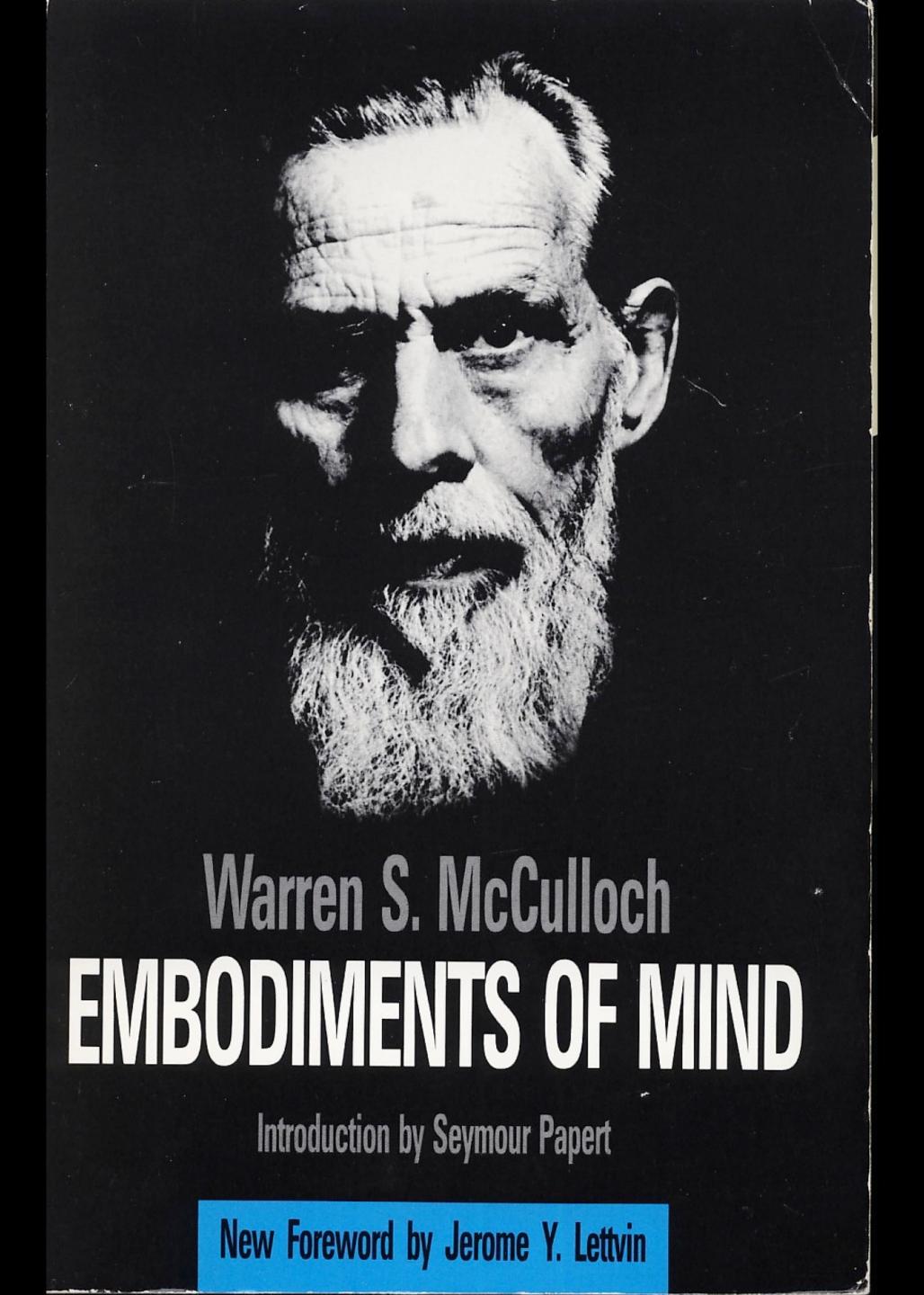


Wiener became world-famous for his work in cybernetics.

But he was not the only important figure at the origin of the field.

Warren McCulloch Neurophysiologist & Poet

Author of *Embodiments of Mind* 1965



Warren McCulloch was a neurophysiologist and genius who gathered world-renowned scientists to a series of conferences.

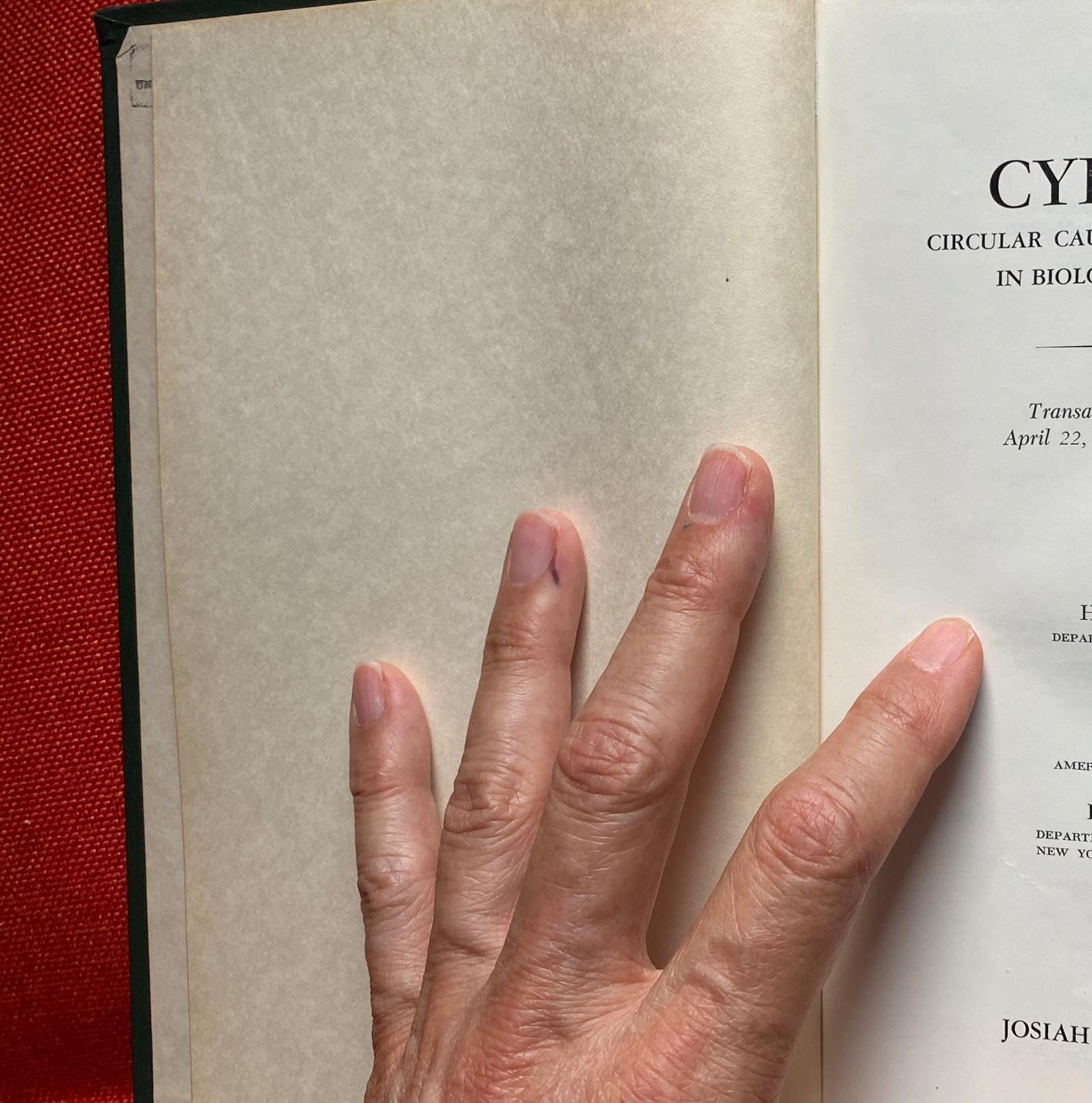
Margaret Mead Anthropologist

Co-founder of American Society for Cybernetics



Margaret Mead was a world-renowned scholar who revolutionized anthropology.

Photo via UN Multimedia



CYBERNETICS

CIRCULAR CAUSAL AND FEEDBACK MECHANISMS
IN BIOLOGICAL AND SOCIAL SYSTEMS

Transactions of the Tenth Conference April 22, 23, and 24, 1953, Princeton, N. J.

Edited by HEINZ VON FOERSTER

DEPARTMENT OF ELECTRICAL ENGINEERING UNIVERSITY OF ILLINOIS CHAMPAIGN, ILL.

Assistant Editors MARGARET MEAD

AMERICAN MUSEUM OF NATURAL HISTORY NEW YORK, N. Y.

HANS LUKAS TEUBER

DEPARTMENT OF PSYCHIATRY AND NEUROLOGY NEW YORK UNIVERSITY COLLEGE OF MEDICINE NEW YORK, N. Y.

Sponsored by the

JOSIAH MACY, JR. FOUNDATION

NEW YORK, N. Y.

Cybernetics = Origin of Neural Nets & Al

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1940s Cyberneticians invent Neural Nets
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1960s Al = Symbolic Al (not Neural Nets)
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1980s Al = Expert Systems (not Neural Nets)

2010s Al = Neural Nets + Big Data + Massive Compute

2020s "Today's Al" = Al everywhere in our lives

But Cybernetics is very different from Al

Cybernetics

Effective action for... reaching goals and... defining new goals.

- Could be applied anywhere
- Lost the competition with computers
- Stolen & elided by French intellectuals
- Reduced to the prefix "cyber-"
- Yet... undergoing a resurgence

"Today's Al"

"Intelligence Inside"...
for transactional interaction...
with efficiency and at scale.

- Limited to digital infrastructure
- Grew from "smaller, cheaper, faster"
- Became an industry, a market
- About deciding more than offering
- Overwhelms daily living

Cybernetics "Today's Al"

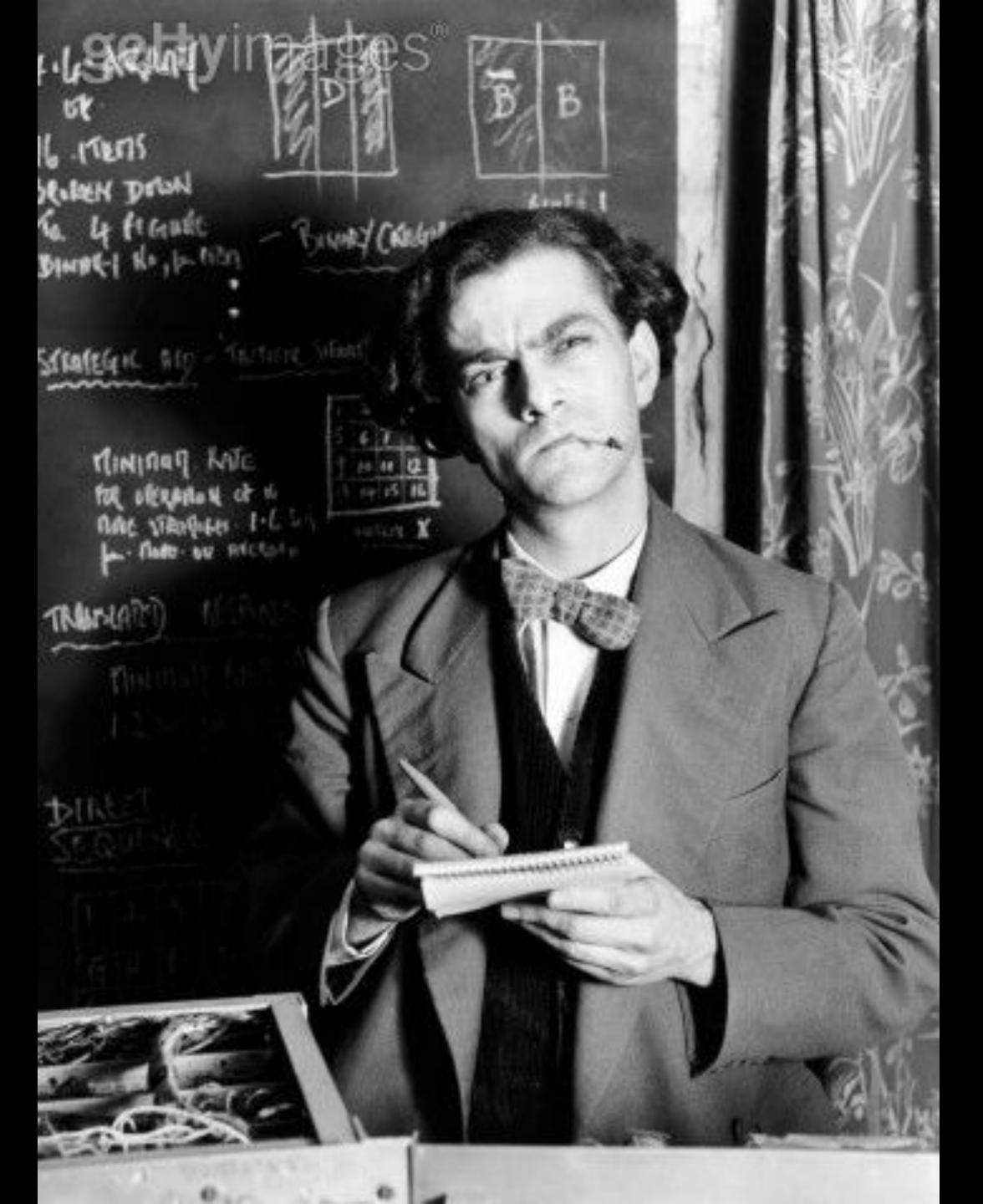
Why & how does Cybernetics move us forward?

- developed before Al—and was Al's foundation
- embodies the art and science of systems with purpose
- offers detailed models of regulation in complex adaptive systems
- applies across siloed disciplines transdisciplinary / antidisciplinary
- brings an ethical imperative to human action
- embraces the unknowable and the unpredictable

Designing for Conversation 5. Conversation & Cybernetics

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Early 1950s

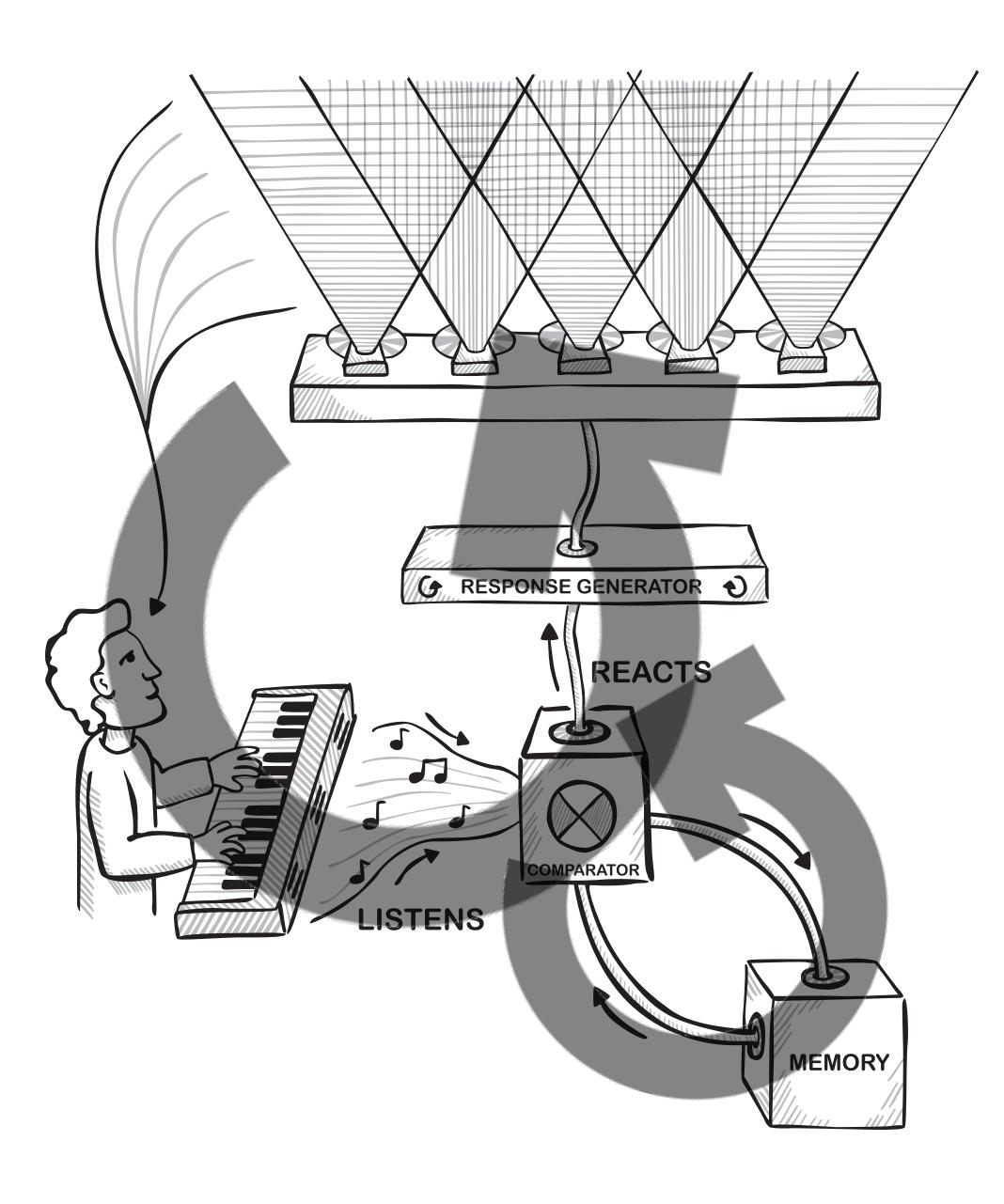
Gordon Pask was a wunderkind who was doing cybernetics before he knew it.

He realized it only after meeting Norbert Wiener.

Photo: Uncredited

Gordon Pask's Musicolour

mid-1950s

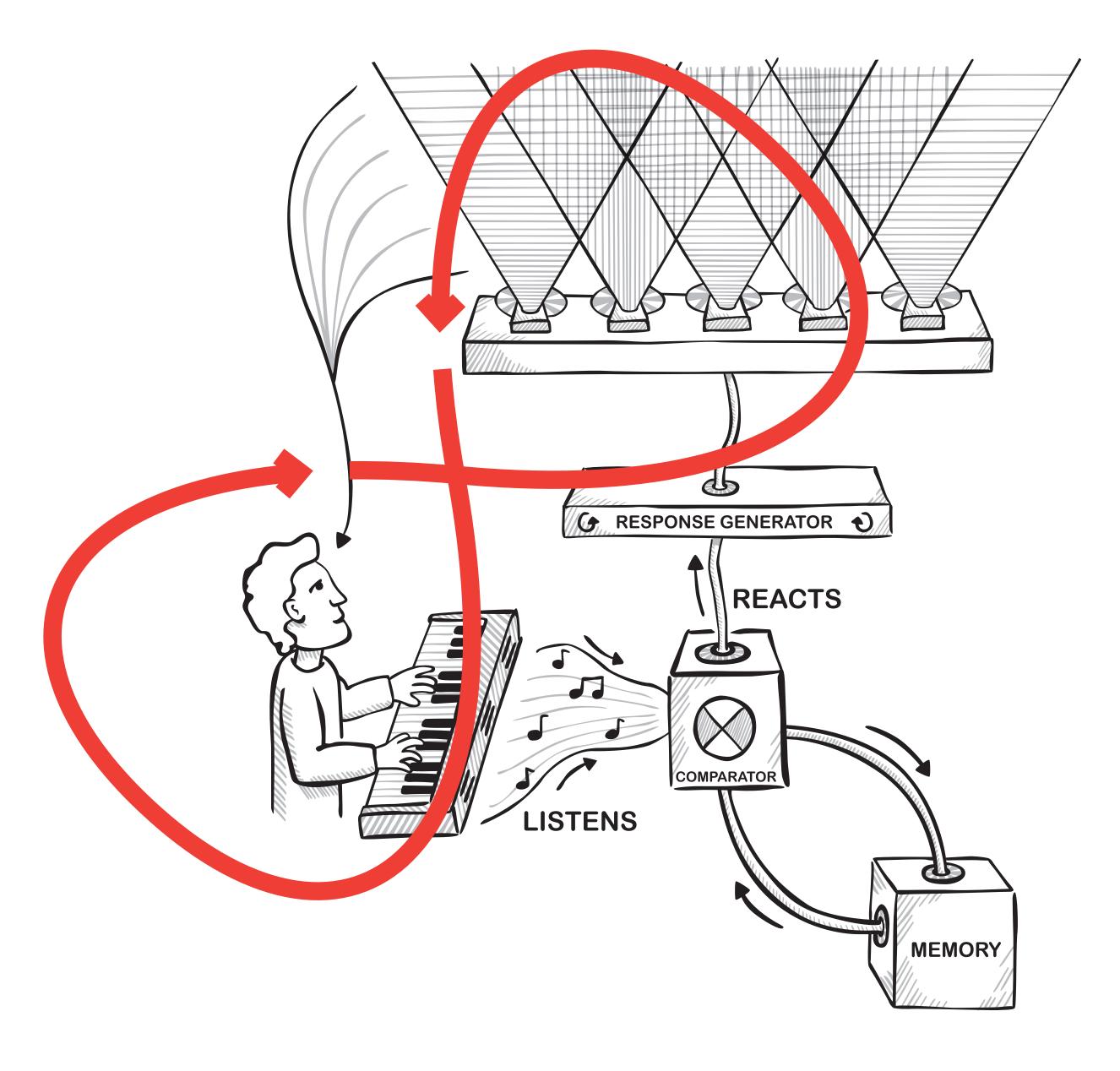


If the musician sees Musicolour is not responding, they change their playing.

Musicolour provokes a conversation between human and machine.

Gordon Pask's Musicolour

mid-1950s



If the musician sees Musicolour is not responding, they change their playing.

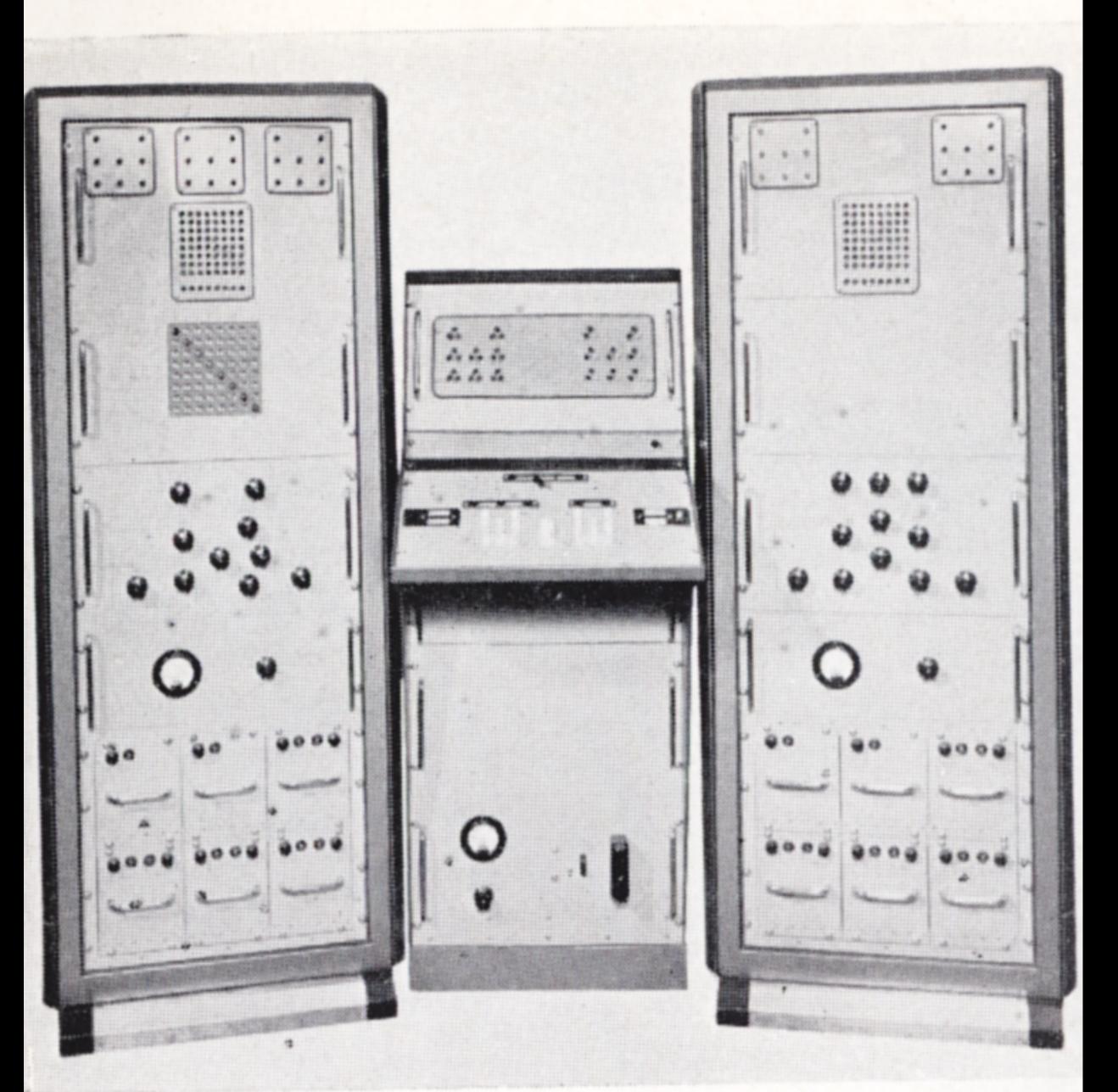
Musicolour provokes a conversation between human and machine.

TEACHER SIMULATOR CONSOLE

PUPIL SIMULATOR

Gordon Pask's Eucrates

late 1950s



Pask created many conversational machines.

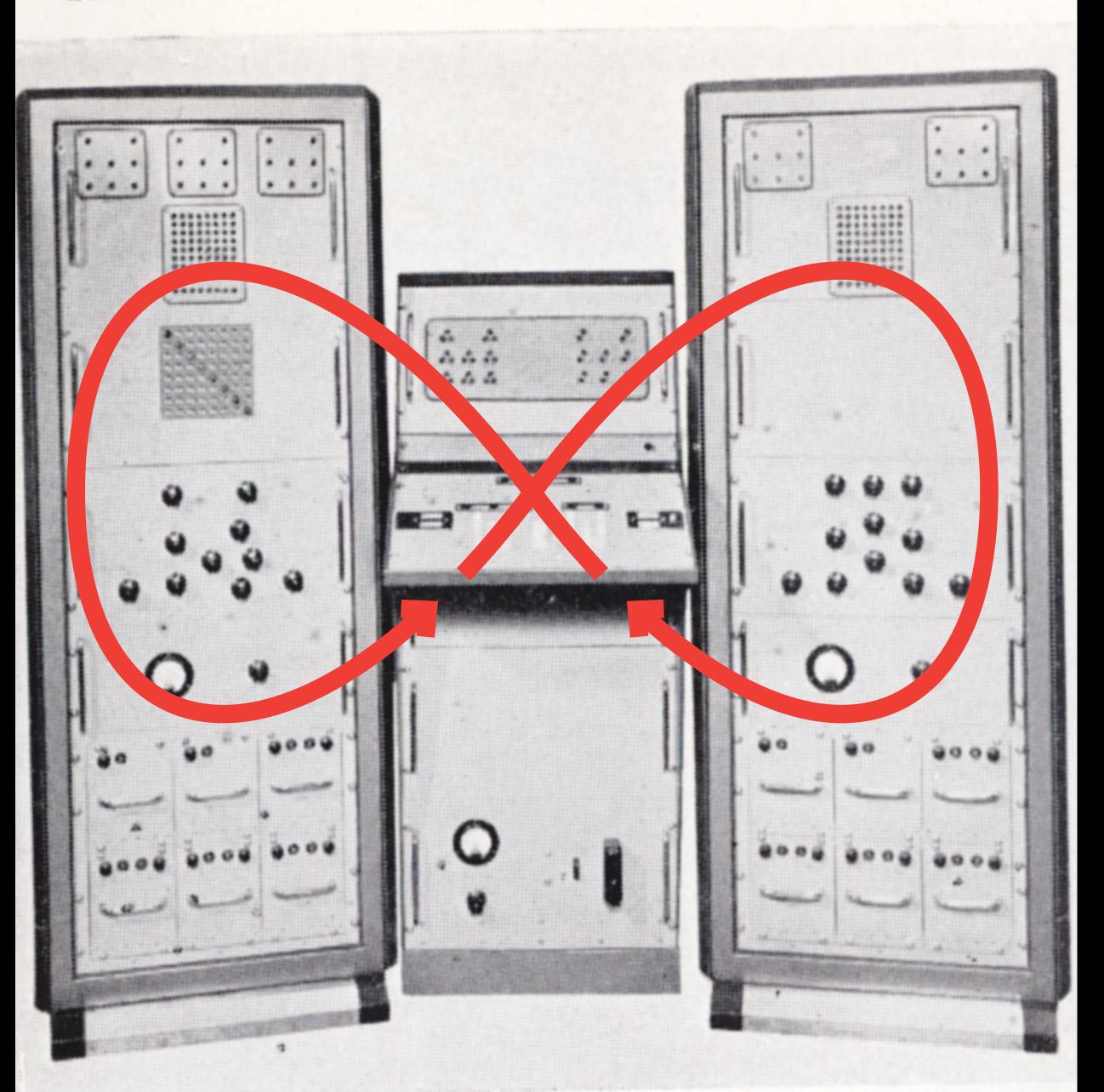
Here a teacher-machine converses with a pupil-machine.

TEACHER SIMULATOR CONSOLE

PUPIL SIMULATOR

Gordon Pask's Eucrates

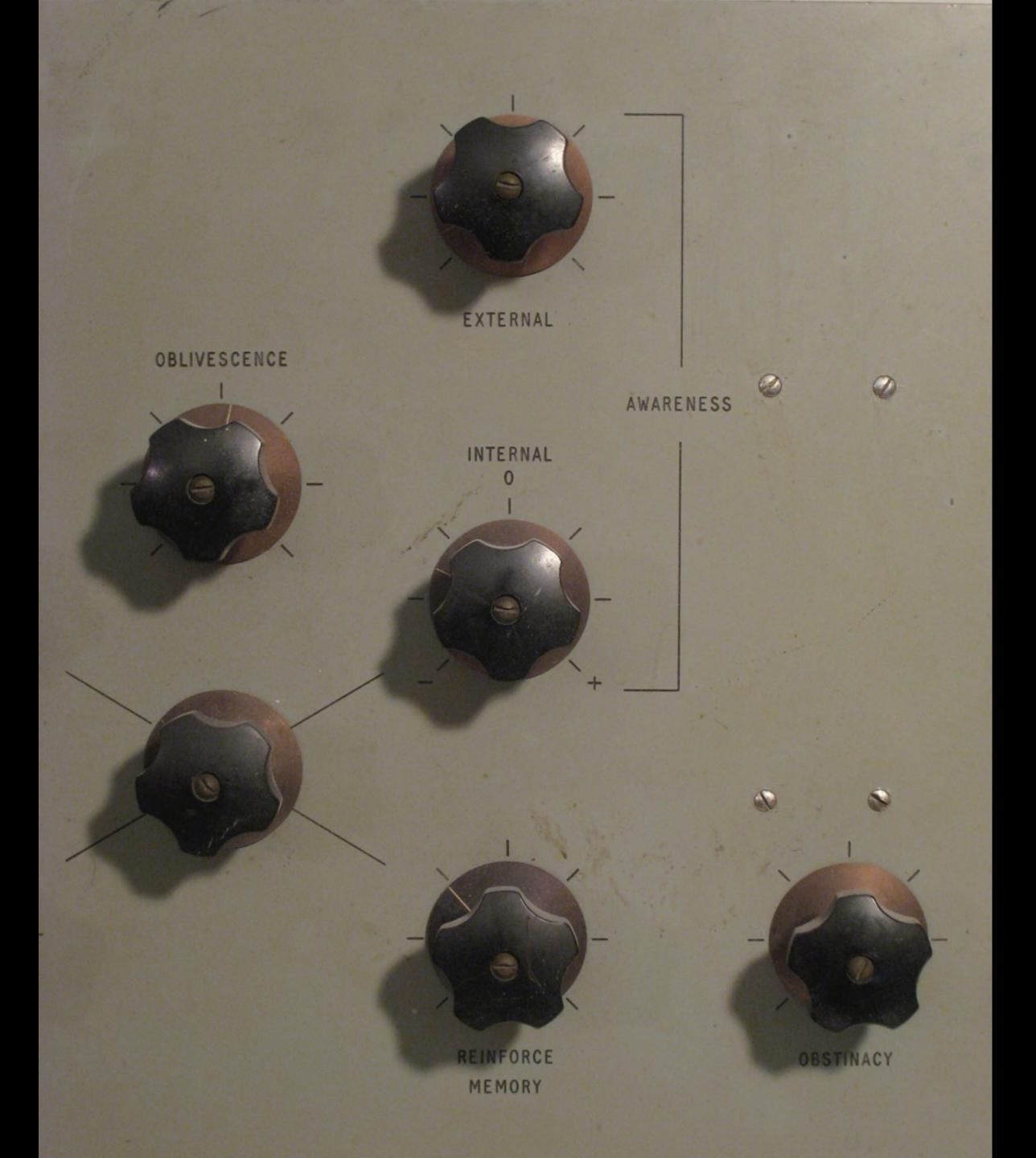
late 1950s



The conversation architecture was the same as Musicolour.

One loop applied feedback from actions and another applied feedback about goals.

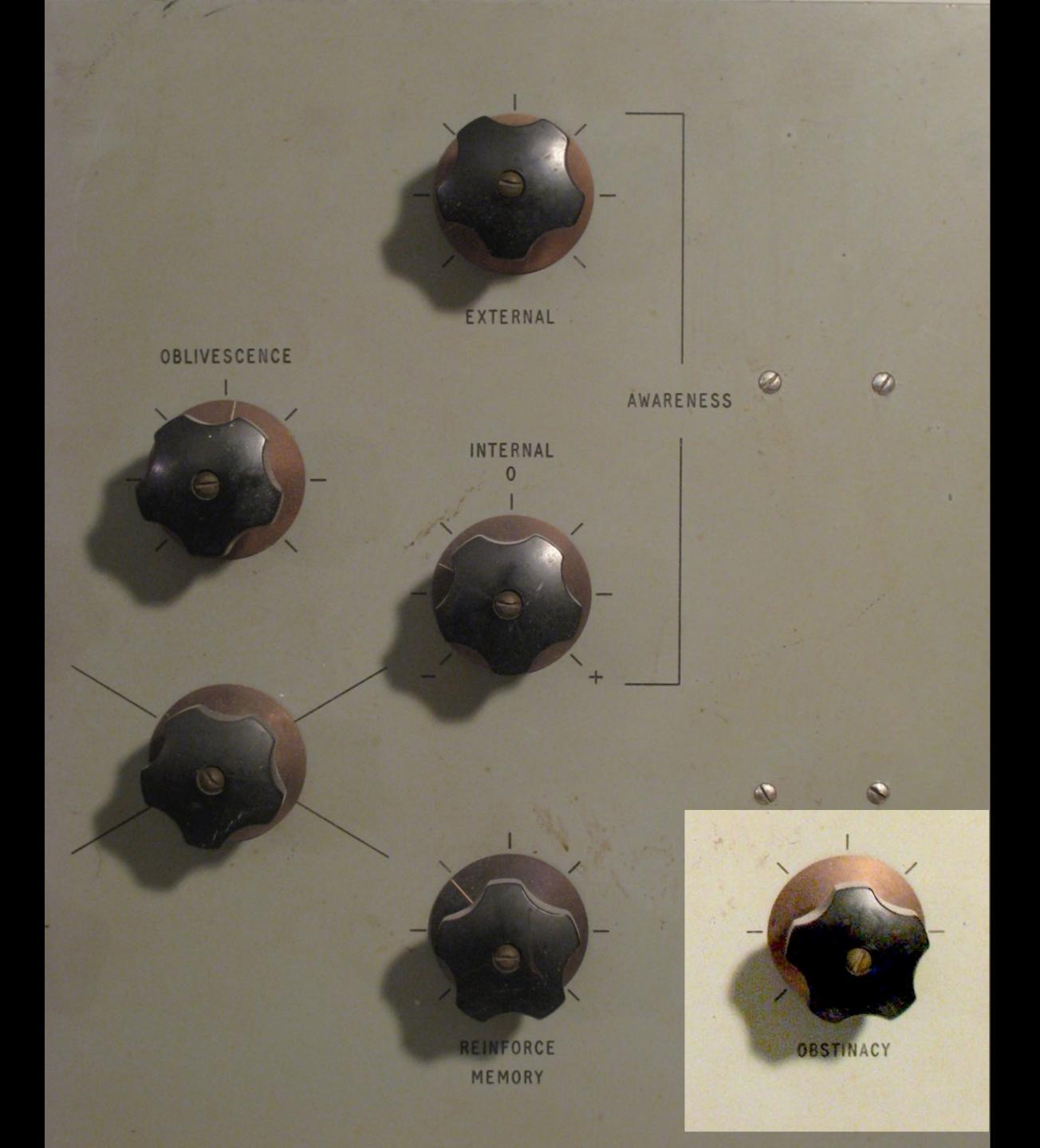
late 1950s



The control panel of the pupil-machine had a knob to control internal awareness

And another knob to control external awareness.

late 1950s



Yet another knob controlled the degree of obstinacy.

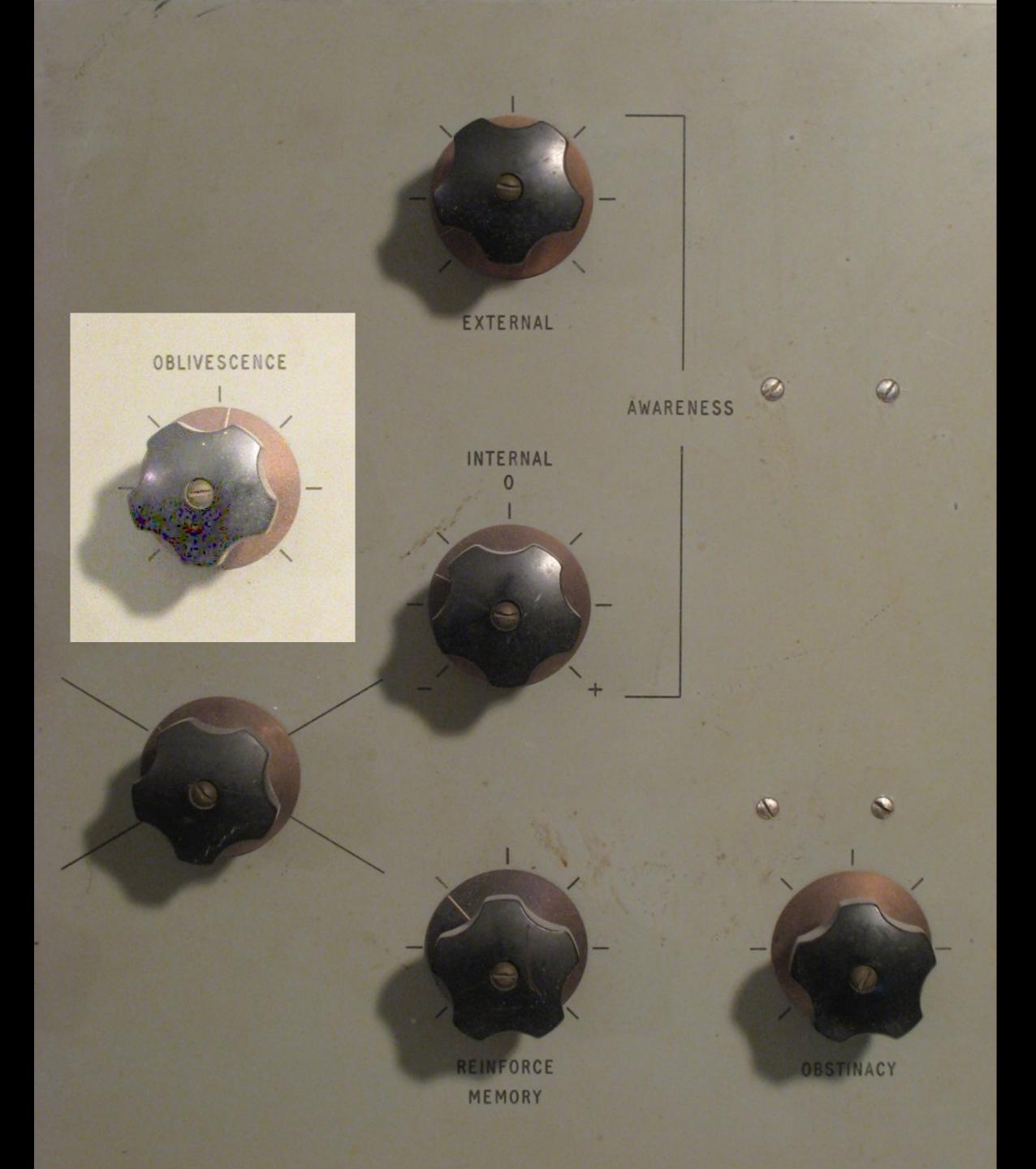
late 1950s



Turning up this knob made the pupil-machine less willing to learn.

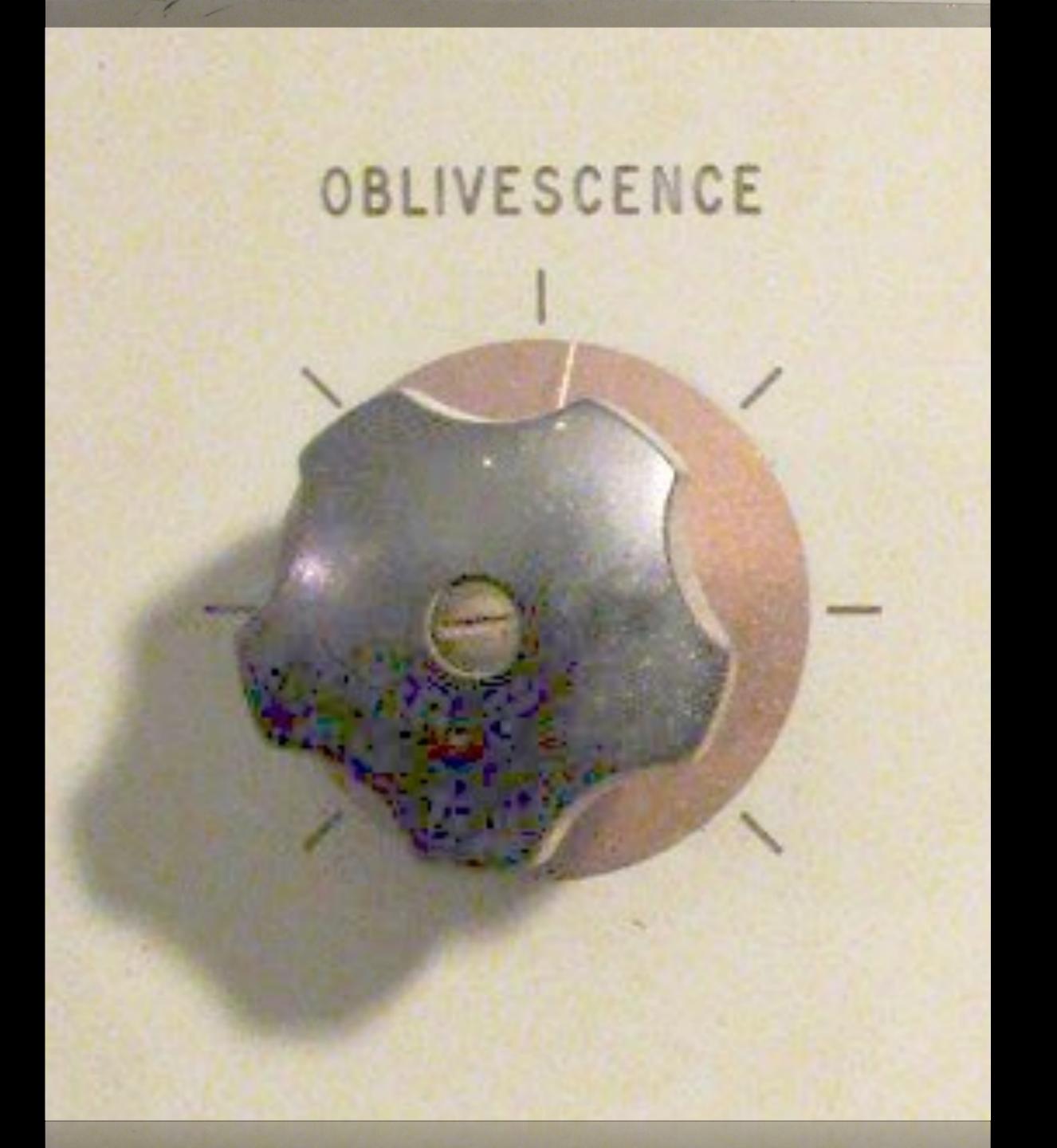
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late 1950s



But there was something beyond obstinacy.

late 1950s



"Oblivescence" means "willful forgetfulness."

Gordon Pask & Elizabeth Pask

1980s

Pask's approach was to create machinery for studying feedback in conversations of all kinds.

That's his wife, Elizabeth.

Photo: Paul Pangaro

Gordon Pask

1980s



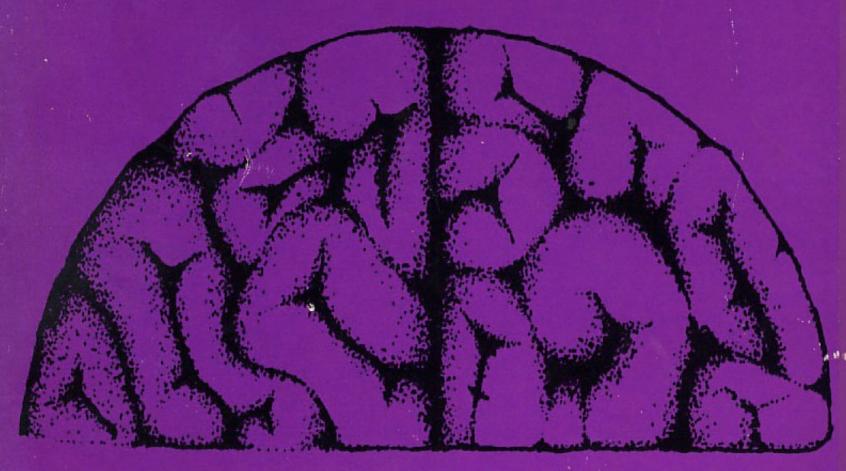
Photo: Paul Pangaro

GORDON/PASK CONVERSATION, COGNITION AND LEARNING A CYBERNETIC THEORY AND METHODOLOGY ELSEVIER

1975

GORDON PASK

CONVERSATION THEORY



APPLICATIONS IN EDUCATION
AND EPISTEMOLOGY

ELSEVIER

1976

In 1976 Nicholas Negroponte edited a book about machines that could converse with designers about designing.

(He later co-founded the MIT Media Lab.)

Book Design: Muriel Cooper MIT Press



Archi tec ture

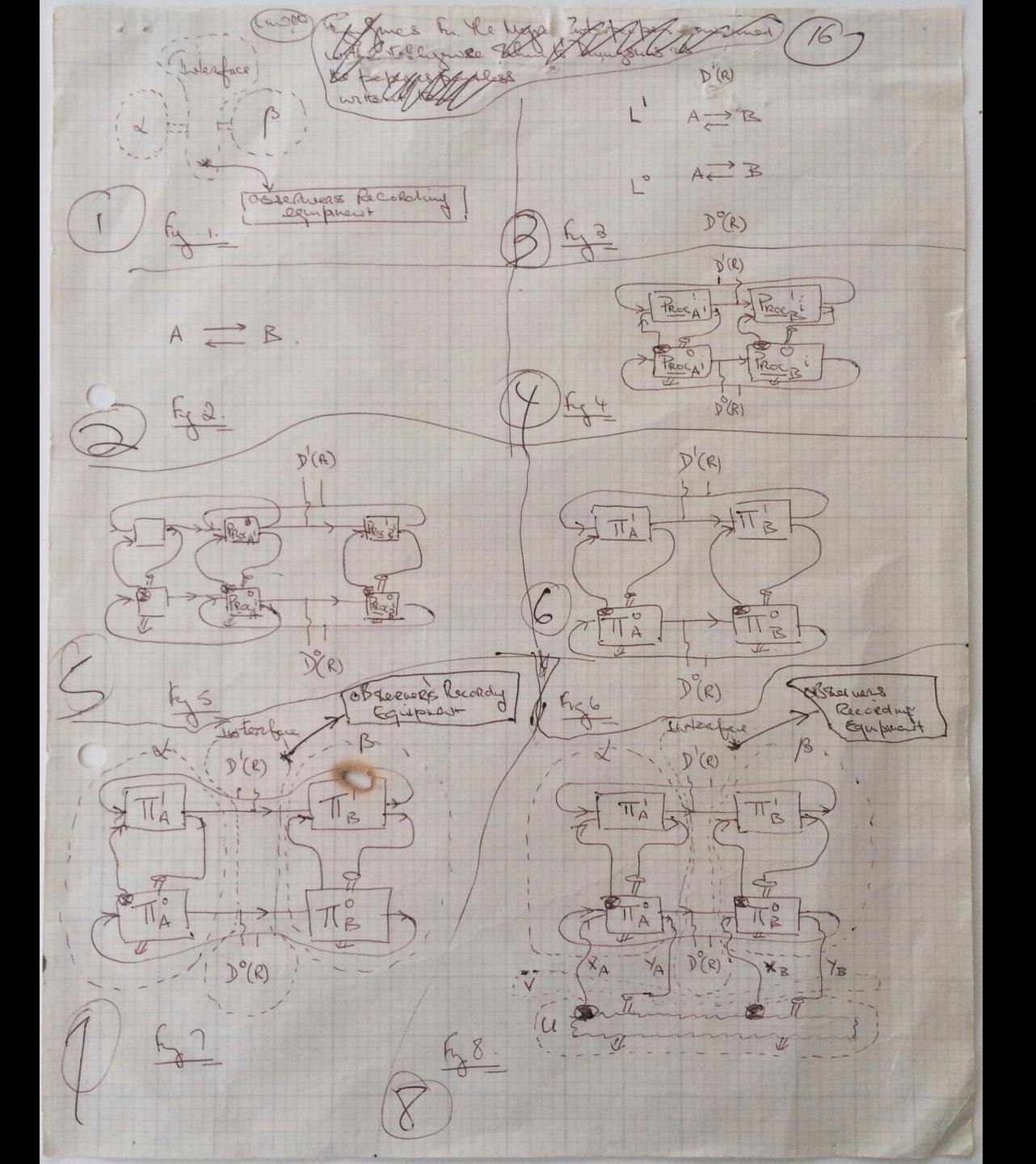
Ma chines Nicholas Negroponte

Aspects of Machine Intelligence

Introduction by Gordon Pask

Pask took the opportunity to summarize his formal approach to conversation and made sketches to explain his model.

Book Design: Muriel Cooper MIT Press



Pask's drawings are playful in character and rigorously complete.

They capture all the interactions involved in conversation.



The work is documented in the book *Architectural Intelligence*.

Nicholas Negroponte

Architectural Intelligence

• Cedric Price

Richard Saul Wurman

• Christopher Alexander

How Designers and Architects Created the Digital Landscape

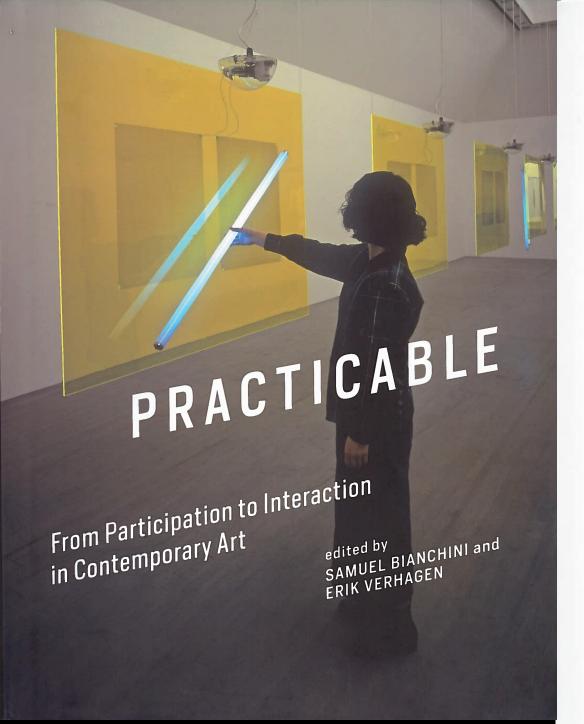
Cover Design: Muriel Cooper

Visible Language Workshop, MIT



2016

Pask's work has influenced generations of designers, architects, and media critics.



1 Gordon Pask's Cybernetic Systems: Conversations After the End of the Mechanical Age

Margit Rosen

In November 1968, K. G. Pontus Hultén's exhibition The Machine as Seen at the End of the Mechanical Age at New York's Museum of Modern Art announced the birth of a new technological epoch. The mechanical machine, "an imitation of our muscles," was about to lose its dominating position to electronic devices, "which imitate the processes of the brain and the nervous system." This observation was not entirely new to the public. Twenty years earlier, in his book Cybernetics or Control and Communication in the Animal and the Machine (1948), the mathematician Norbert Wiener had described the advent of the "age of servomechanisms," of automata that were equipped with equivalents of human and animal sense-organs and coupled to the external world "by a flow of impressions, of incoming messages, and of the actions of outgoing messages."3 Nor was Hultén the only curator responsive to the technological transition described by Wiener and popularized by the mass media. Earlier, in August 1968, a young British curator, Jasia Reichardt, had opened an exhibition titled Cybernetic Serendipity at the Institute of Contemporary Arts in London in which she sought to show how the new information technology—its devices and theoretical models—were about to transform science and art. Hultén's The Machine also included a few electronic responsive works, but Reichardt's Cybernetic Serendipity presented many more electronic objects, as well as environments that seemed to fulfill the promises of the epoch of communicating machines.

The visitors of both exhibitions experienced a new relationship with artifacts that were equipped with light and sound sensors and responded in real time to changes in the environment, of which the spectators formed a part. These machines incited the viewers to break the rules of bourgeois art perception. Instead of quietly contemplating the exhibits, they moved and made the exhibition space resound with their whistles, voices, and clapping hands. This behavior provoked by the electronic objects and environments was a perfect fit with what Hultén identified as "one main trend of the

When a recent book referenced the origins of interactive art, Pask is invoked in the first chapter.

2016

Pangaro | February 2022

c Theater,²⁴ a concept that he developed in ivist Joan Littlewood and Gerry Raffles, proattern of his cybernetic conversations. Pask ick in theater—such as applauding or leaving i to replace them with a more accurate proth signal transmitters that would allow them erent options to further the play's course. In n it was necessary, according to Pask, to ask

text written in 1960 by Pask and Heinz von der cyberneties, indicates that prompting the rough decision-making processes had wider decision-making as essential to the human red: "man *must* make decisions about somehrased as follows: the potential envinunicative and adaptive artworks became the tion in the field of art. They were supposed ke choices and to react in real time, thereby



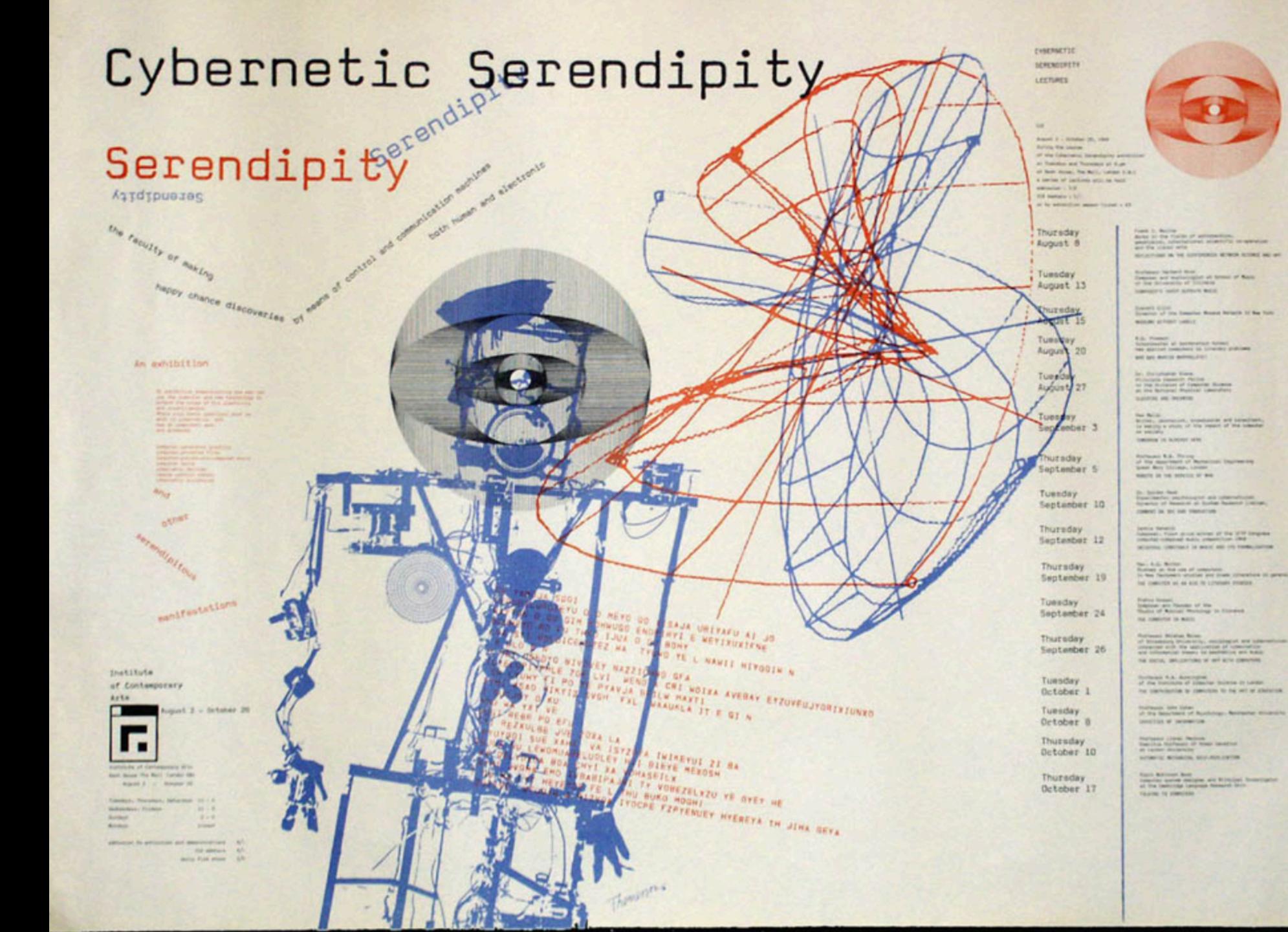
Figure 1.2 Gordon Pask, Colloquy of Mobiles, 1968. Installation view showing part of Gordon Pask's Colloquy of Mobiles, with Peter Zinovieff's computer in the background, in the exhibition Cybernetic Serendipity, Institute of Contemporary Arts, London. Courtesy of Jasia Reichardt.

reinforcing a person's perception of him- or herself as an acting subject that could see him- or herself "reflected in the environment." This assumption that the spectator desires to take the role of the artist had little to do with traditional notions of creation or creativity. It was simply about the experience of seeing that one's actions had an impact, if only on a fragile electronic device in an exhibition space. The machine perceived the individual; therefore the latter existed.

Inducing Happiness

Pask staged his adaptive systems in the art context as devices to induce pleasure. Beyond pure physical responses, a person should taste the delights of learning—that is Colloquy of Mobiles is heralded as the first work of its kind.

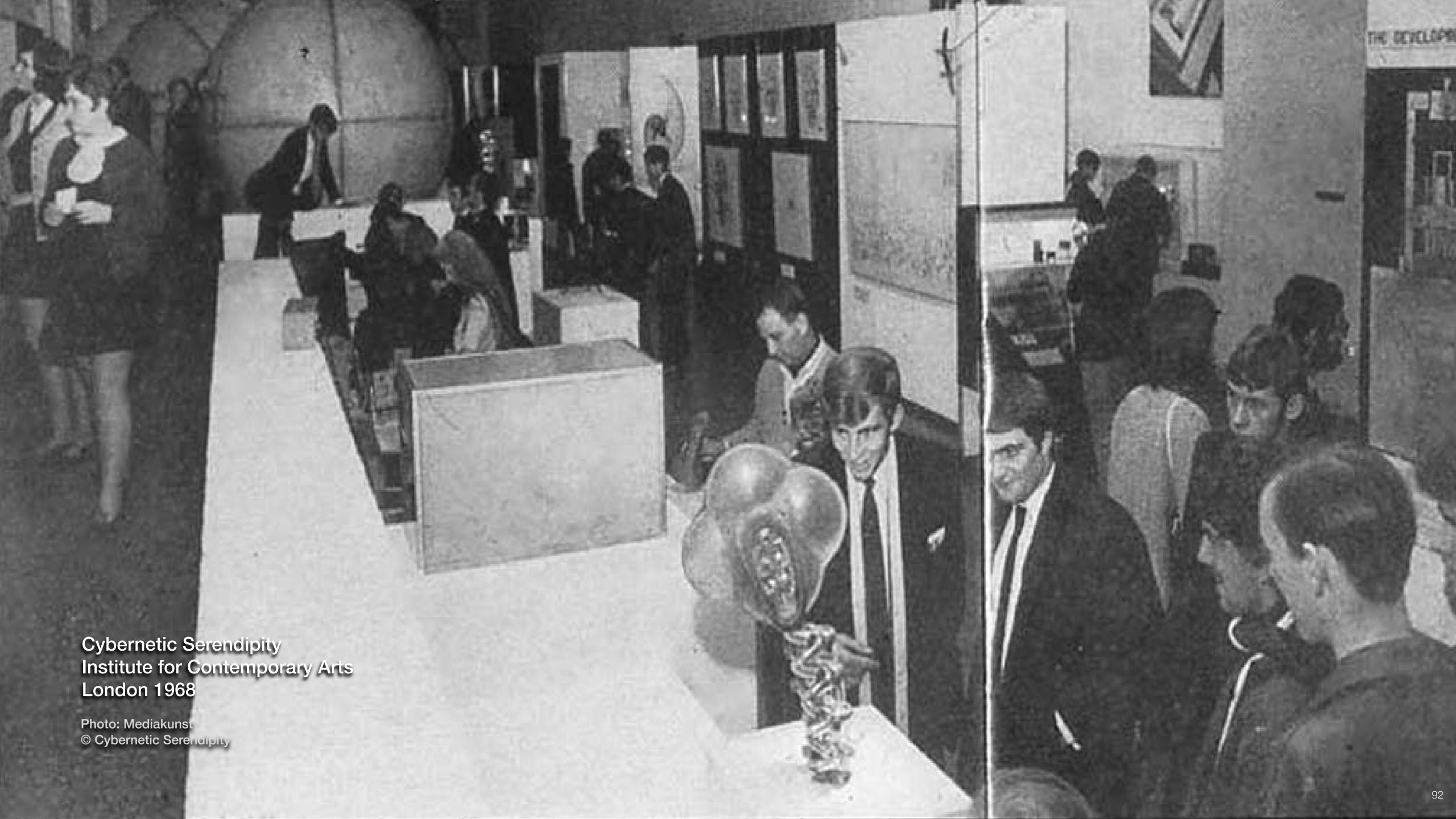
2016



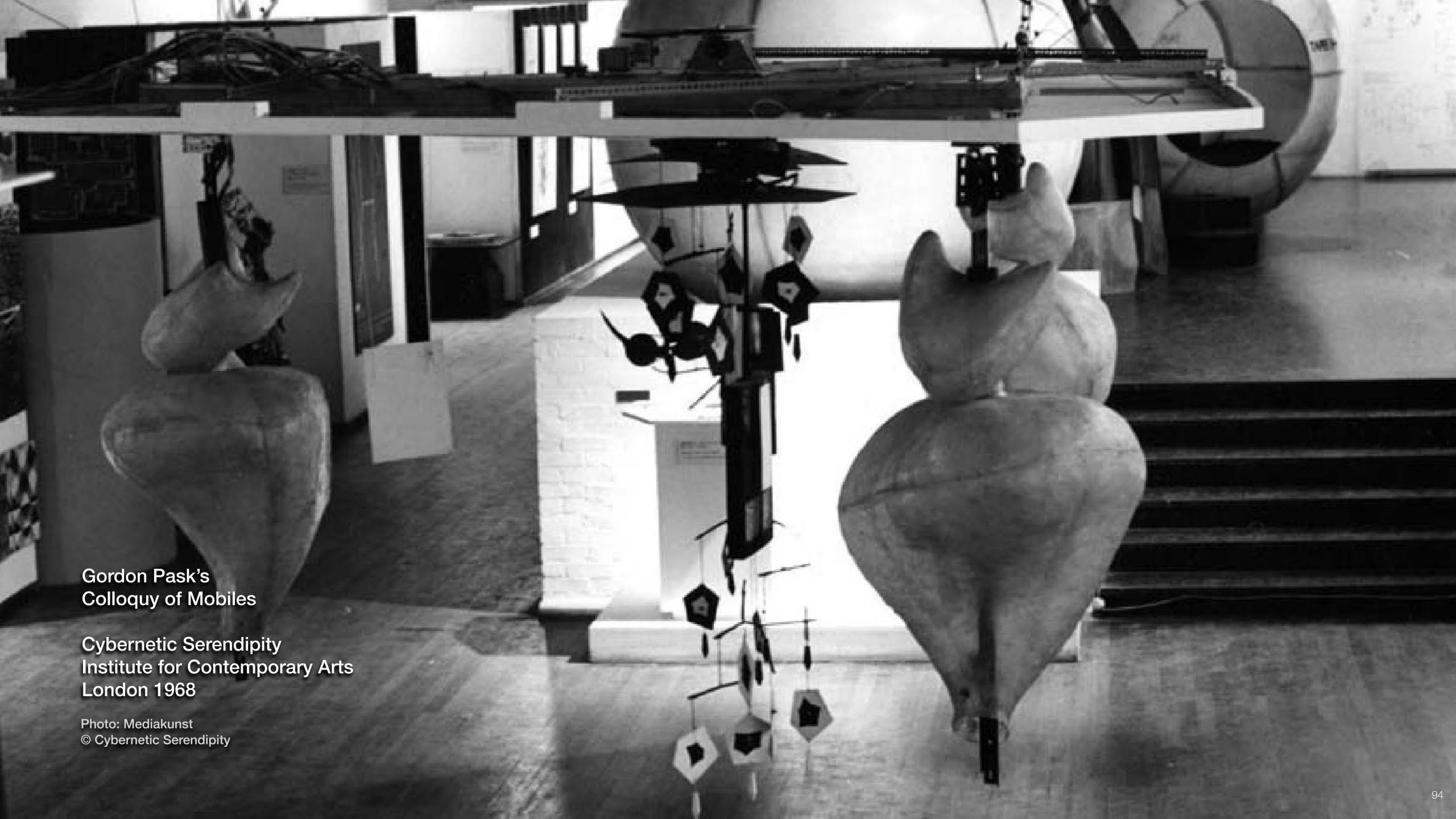
Exhibition poster by Franciszka Themerson

Photo: Mediakunst
© Cybernetic Serendipity







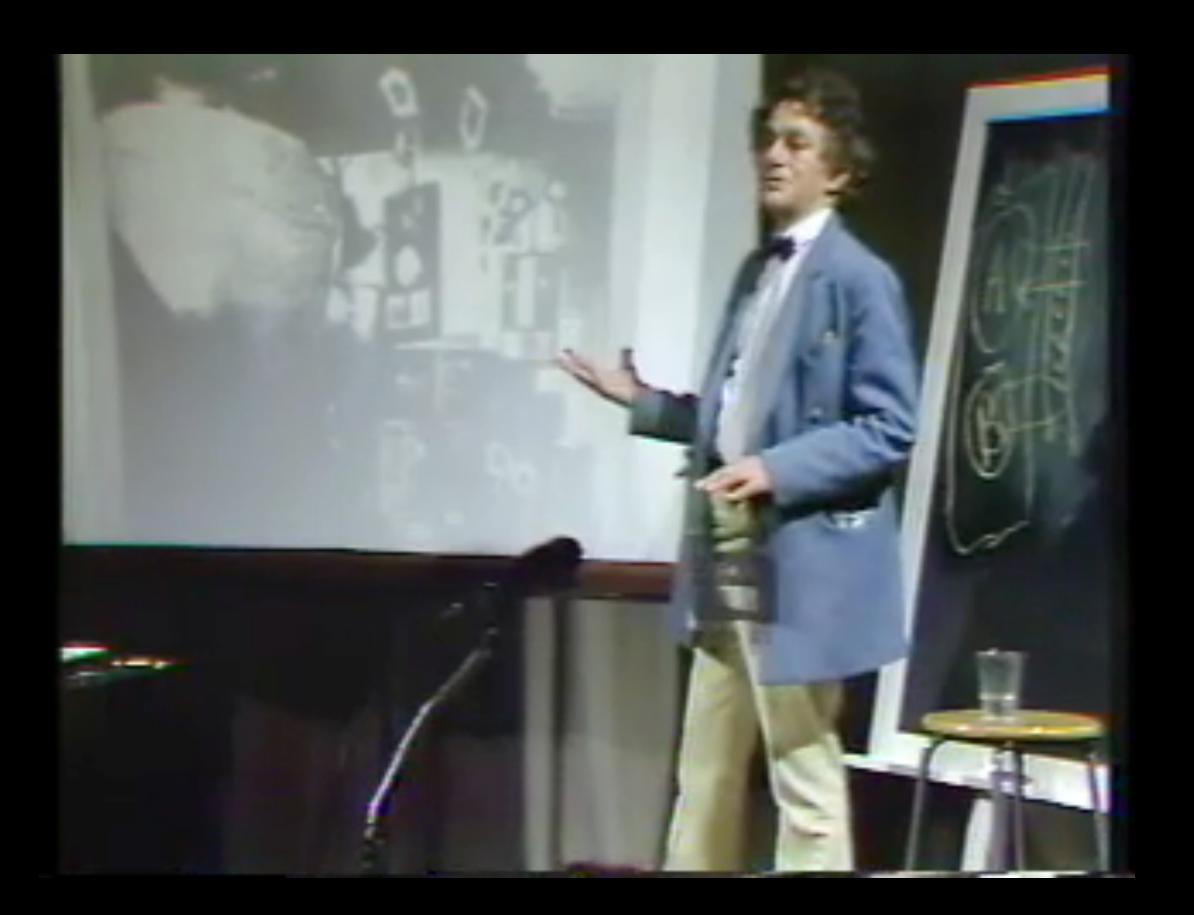




Gordon Pask Concordia University Montreal, Canada

1979

Click here for Vimeo



...not restricted by any means to use in the classroom or certain places like that. That is a machinery, hardly discernible perhaps, for um... running a Colloquy of Mobiles, as it was called.

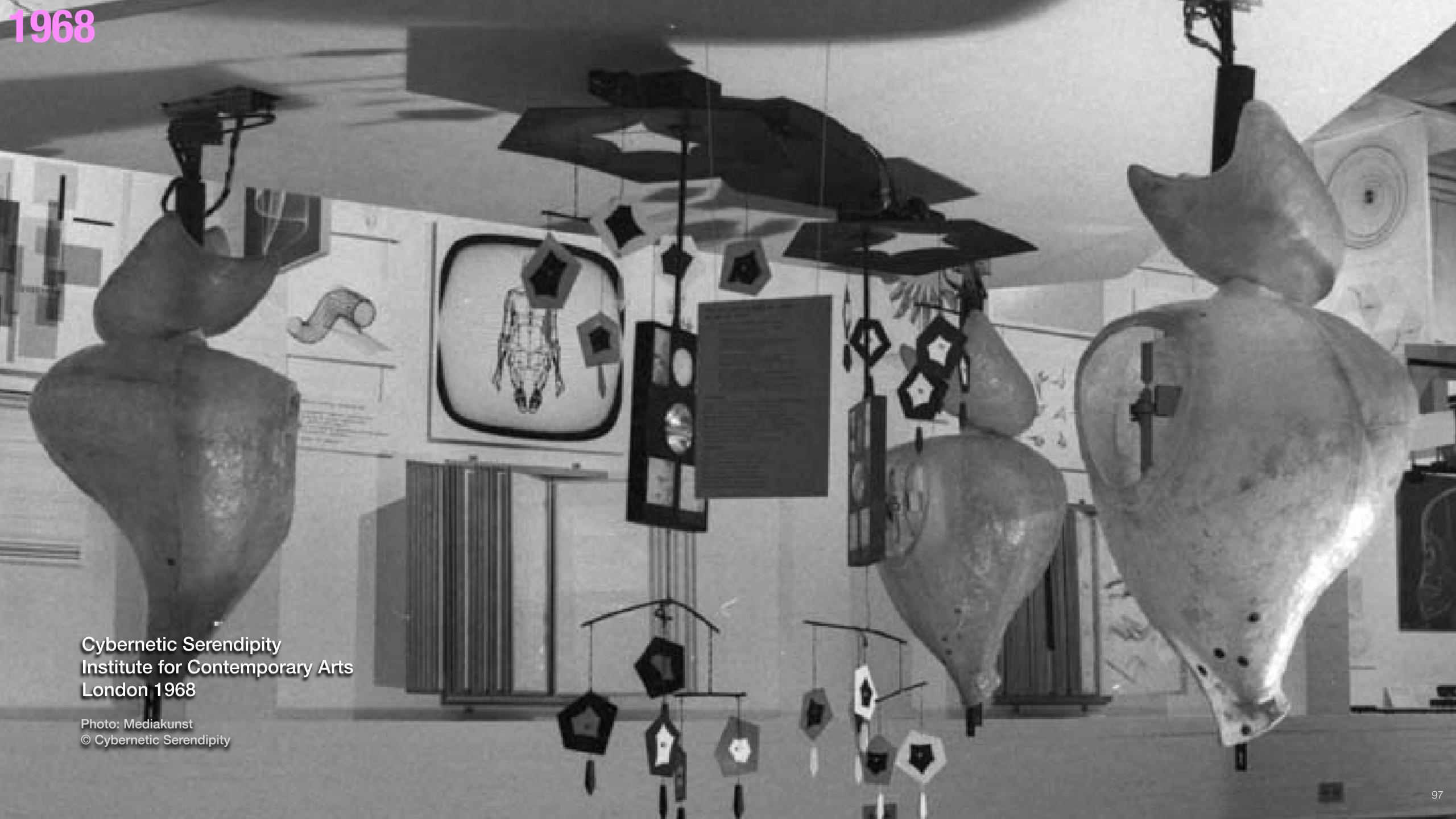
Ah, it's the wrong way up, yes.

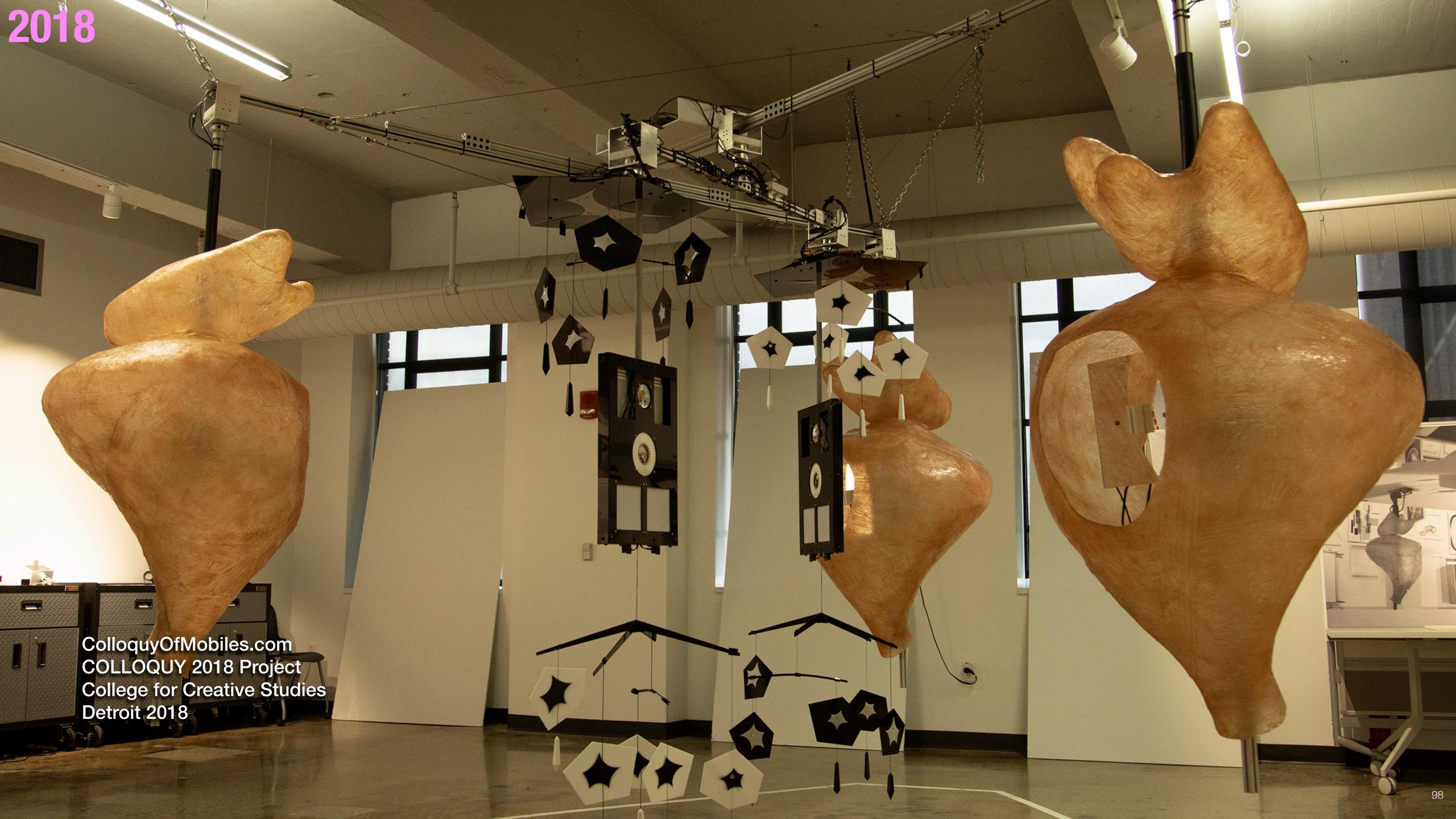
These were large suspended mobiles and I was taxed with the ability of making an exhibition piece for entertainment, in fact, where people would engage in "conversations through"...

So I made a family of mobiles which were these things on mechanically rotating beams, an environment out of PDP8 [mini-]computers and whatnot, and what in those days was the equivalent to a microprocessor with a load of junk in each one.

The point being that the mobiles had a life of their own and they chatted to each other by beams of light which they waggled up and down and by hooting sounds and so forth and anybody could go into that discourse if they wanted to or hoot at them and put their hand up in front of the light.

And they did.





TJ McLeish, Master Fabricator COLLOQUY 2018 Project MFA Interaction Design College for Creative Studies 2018



Centre Pompidou, Paris, France 2020



ZKM Museum, Karlsruhe, Germany 2021—













Conversation Redux — C-L-E-A-T

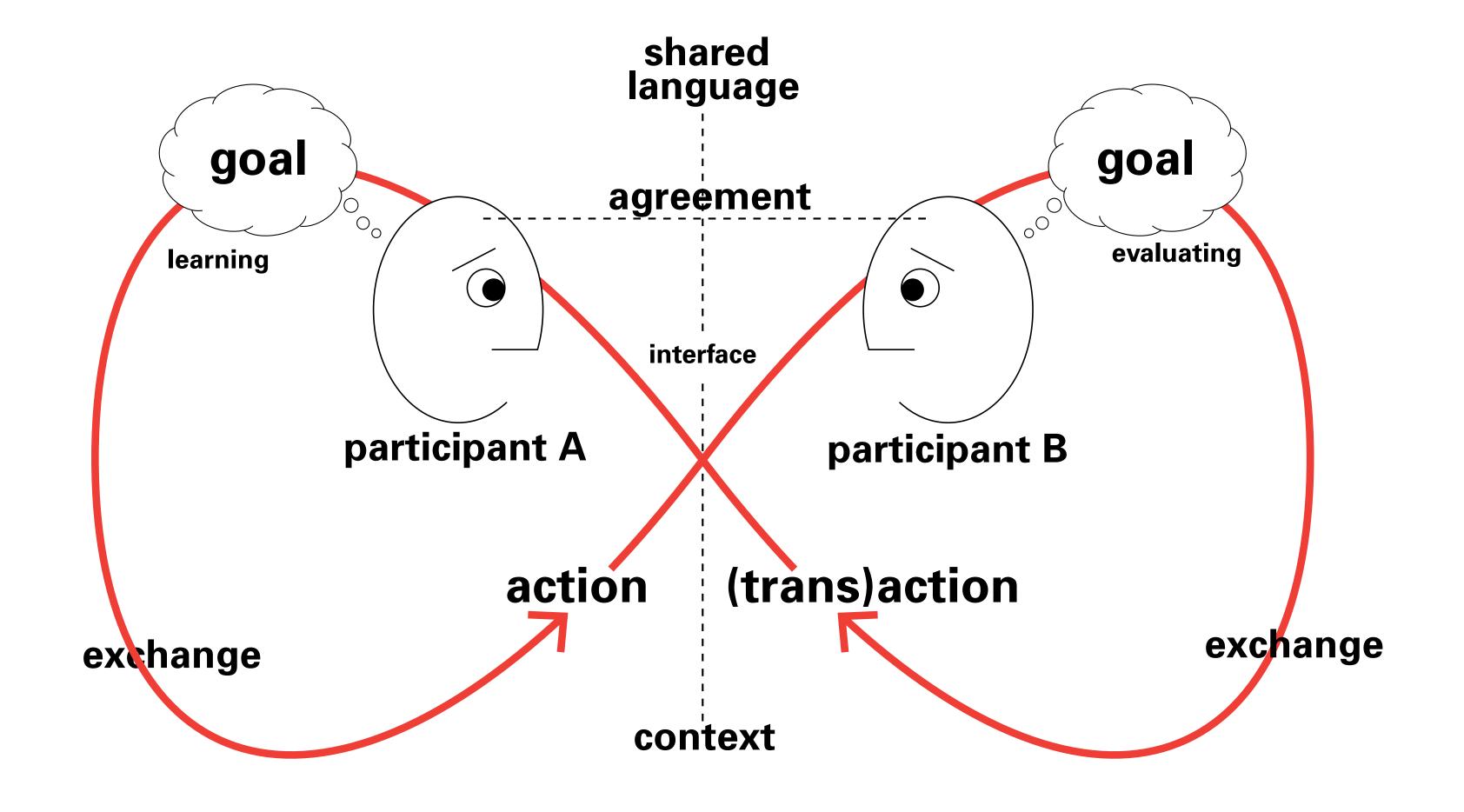
C - Context

L – Language

E – Engagement

A – Agreement

T – Transaction



after Gordon Pask

Pangaro | February 2022 10606

Gordon Pask—Analog Interaction

Colloquy of Mobiles

Autonomous agents that converse and cooperate Bilingual sensibility—organic & social, machinic & digital

Information triggers response, does not determine it

Intelligence in the interaction, not stand-alone



Goals of Conversation Theory

To rigorously understand what makes conversation work—and to make machines conversant like humans.

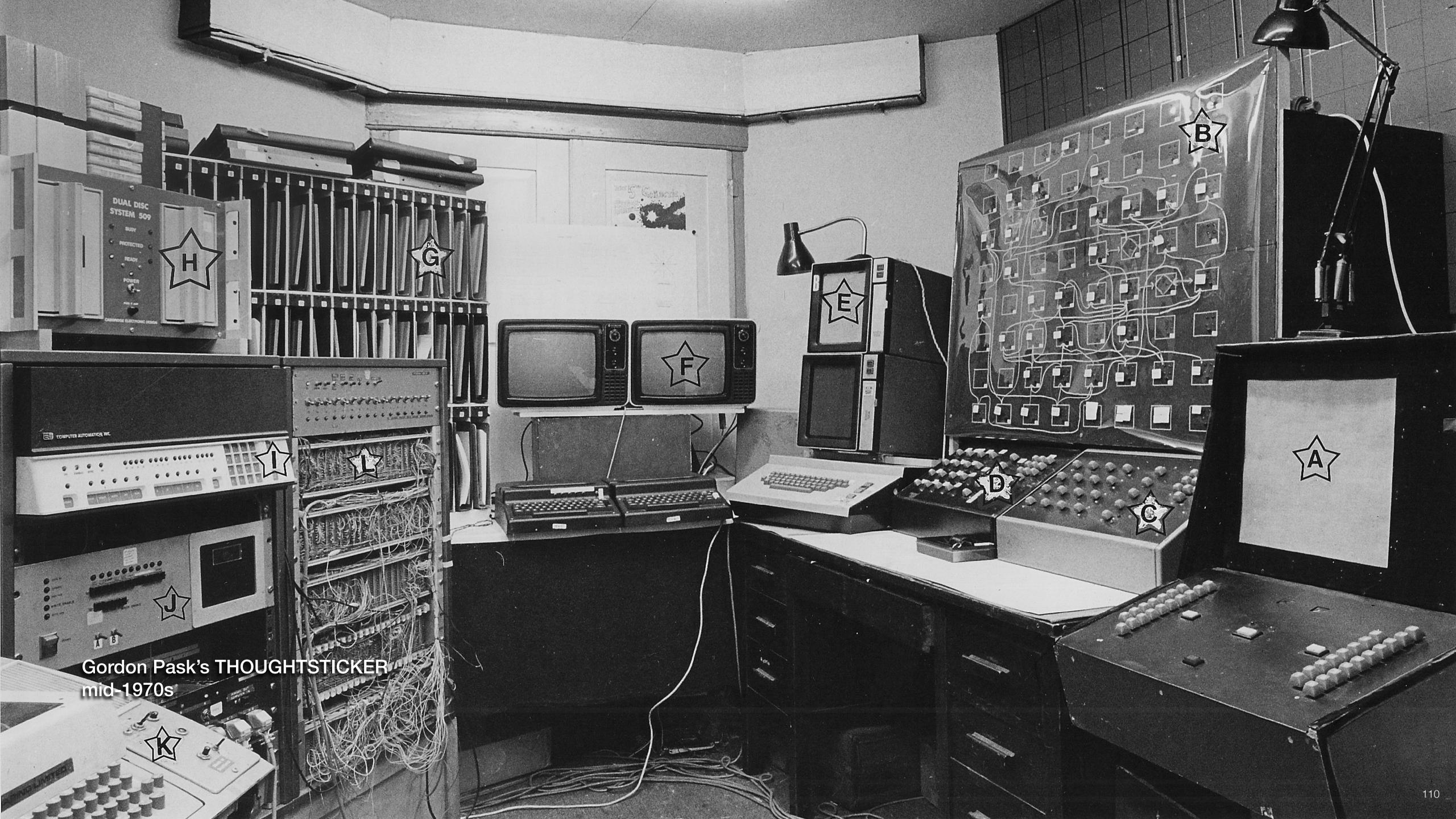
To rigorously understand how systems learn—and to makes machines that learn like humans.

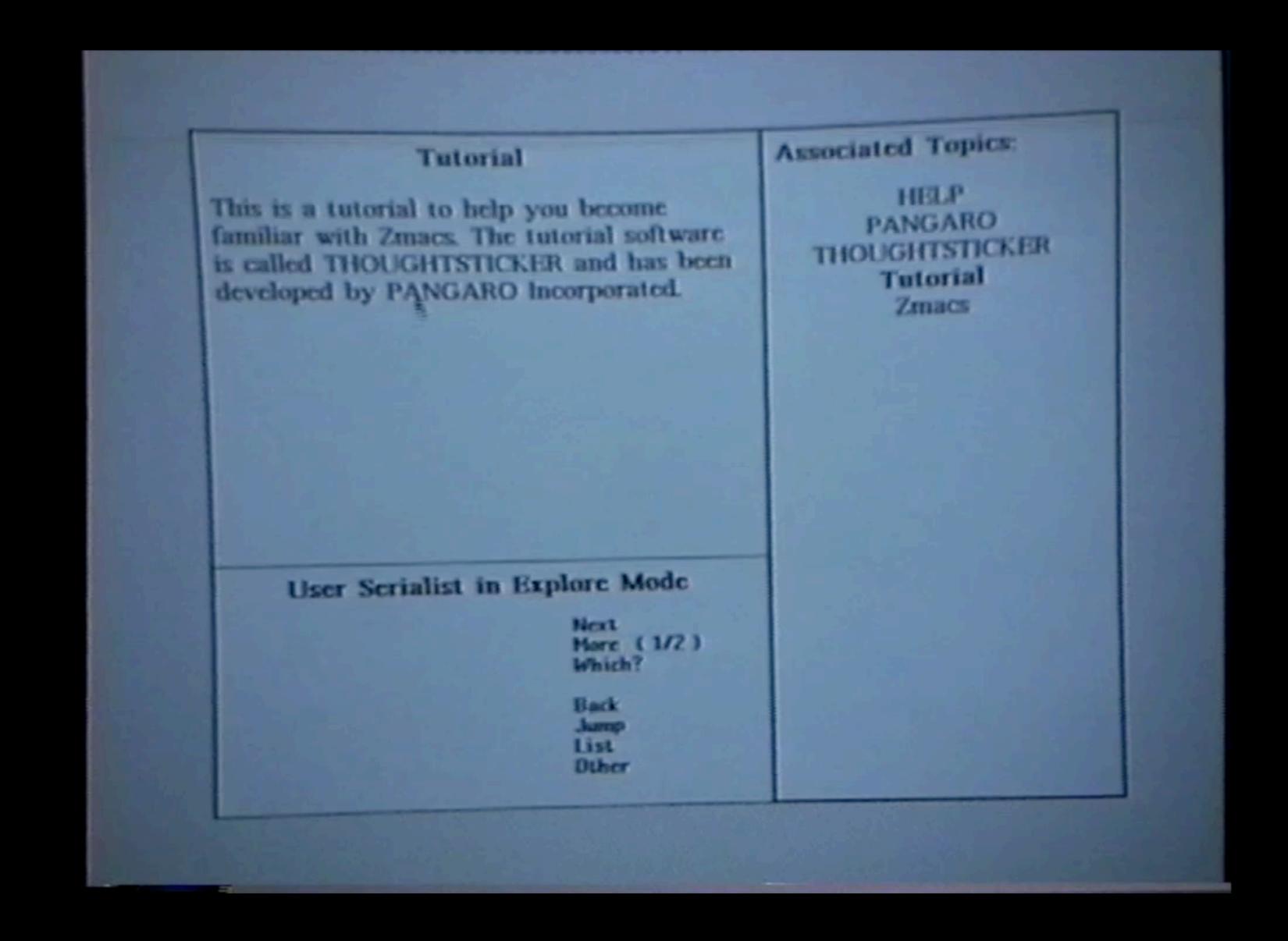
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Designing for Conversation 6. Conversational Interface Design

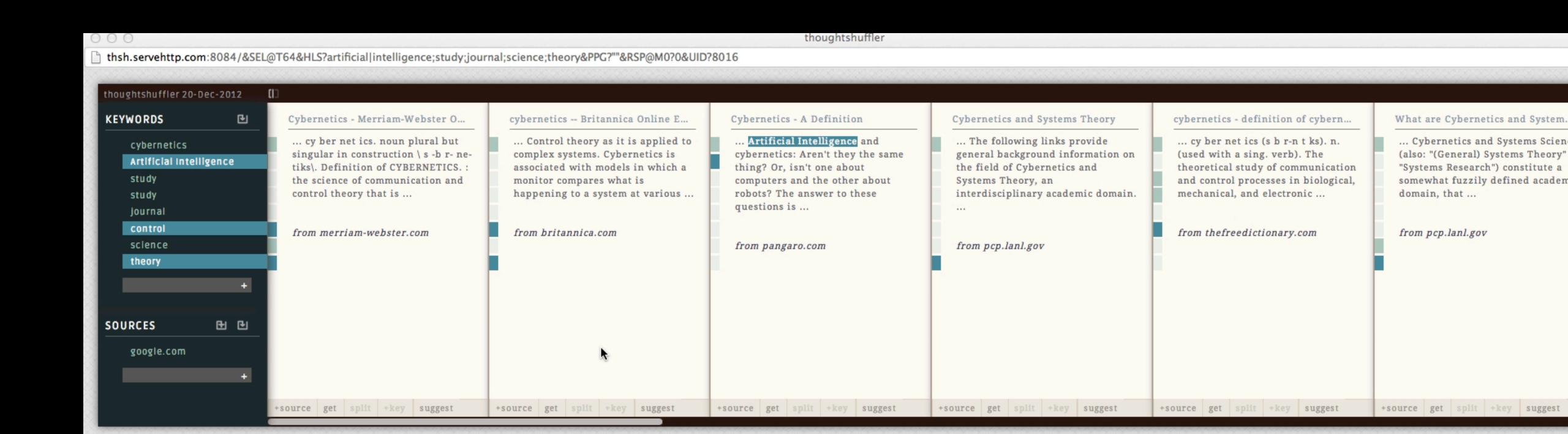
Graduate Graphic Design Studio II — NC State February 2022

pangaro.com/ncsu2022





Thoughtsticker
Ph.D. Dissertation
Paul Pangaro
1987



ThoughtShuffler
UI design and coding by Jeremy Scott Diamond
UX & heuristics by Paul Pangaro
2012

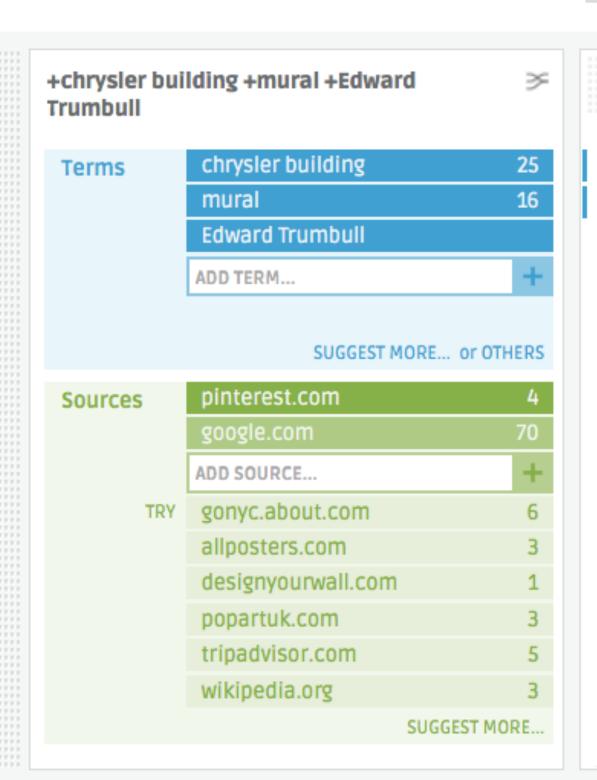
ThoughtShuffler

MAKE SENSE OF THIS

Q

TOOL-TIPS

N OFF



Chrysler Building, 1 Sheet Mini-Mural By Henri Silberman Wall



New York Photography Mini Wall

Mural (1 Sheet): The Chrysler

building is one of the most
infamous landmarks in New York
and now you can turn it into a
stunning feature for your wall. This
beautiful black and white

popartuk.com

deco and nouveau on Pinterest | Chrysler Building, Murals and



Gorgeous, if tiny, detail from

Edward Trumbull's spectacular

mural "Transport and Human

Endeavor. " This brilliant painting is
displayed on the ceiling of the
lobby of New York's Chrysler

building, the second-best

Chrysler Building, Murals and Oyster Bar

AL MENICTORAM -7 CO TO

wikipedia.org

Talk:The **Chrysler Building** -Wikipedia, the free encyclopedia

Groundbreaking took place on
September 19, 1928. When Van Alen
began construction of the Chrysler
Building, he planned to have the
building stand 925 feet tall. At the
same time that the Chrysler
Building was being built, former
partner H. Craig Severance was
working on building the Bank of
Manhattan.

Chrysler Building lobby ceiling mural - Picture of Chrysler



Having seen the **Chrysler Building**from various points around
Manhattan, including the top of the
Empire State Building, I had to take
a look inside. It is my favourite
building in NYC and I was not
disappointed. The lobby has

tripadvisor.com

DUPLICATE SHARE DELETE AUTHOR

ThoughtShuffler v2
UX by See-ming Lee
concept & heuristics by Paul Pangaro
2013

national geographic, fracking, Hydraulic fracturing, water, oil, sand March 2013 National Geographic Cover Story: "America Strikes Oil... nysfrackingunplugged.wordpress.com In his article entitled "America Strikes Oil: The Promise and Risk of Fracking," Edwin Dobb, a Berkeley Graduate School of Journalism lecturer and National Geographic contributing writer, focuses **fracking** activities in North Dakota. • • • • • • • • • 訌

10:03 AM

Carrier 🔝 🔆

thoughtshuffler v3 iOS
UX by Miriam Simun
UI by See-ming Lee
concept & heuristics by Paul Pangaro
2013



THE NEW YORKER



NEWS

CULTURE

BOOKS & FICTION

SCIENCE & TECH

HUMOR

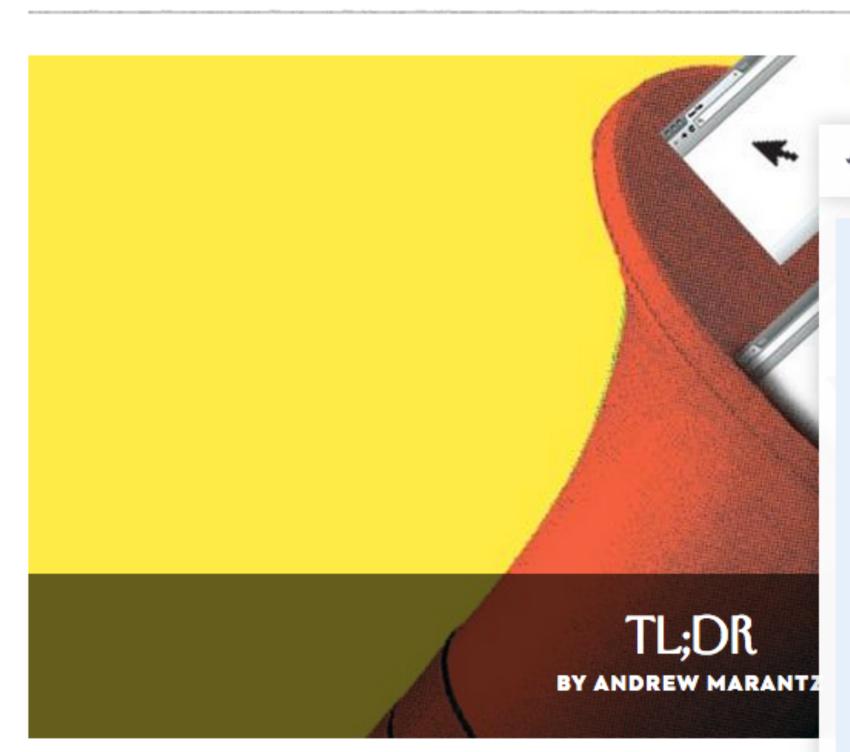
MAGAZINE

ARCHIVE

VIDEO

SUBSCRIBE





KING OF CLICKBAIT

 The ability to make things go viral felt like the closest that we could get to having a human superpower."

He offered practical tips: "Facebook should be eighty per cent of your effort, if you're focussed on social media"; "Try to change every comma to a period"; "Use lists whenever possible. Lists just hijack the brain's neural circuitry." Behind me, two women in their fifties took notes on legal pads.



Facebook: The World's Biggest Direct-Market...
In a conference call after the release of this week's earnings, she gave a couple of examples of how it is gradually displacing

Can Benefit Corporations Work?

Yet the desire to balance profit and purpose is arguably a return to the model that many American companies once followed. Henry

Streamfully

UI by Barbara de Wilde & John Katagawa UI coding and AWS coding by John Katagawa UX & heuristics by Paul Pangaro 2014

Streamfully



qz.com

Starbucks is finally going to show US coffee drinkers what a "flat white" is. Prepare for controversy – Quartz

1/1/2015, 7:00:26 AM

Starbucks is introducing the "flat white" to its coffee menus across the US on Jan. 6, reports Eater. It's a Little surprising it took this long; the drink has been available for years in the UK and Australia, which both consume far less coffee per capita than the US. (It's also a popular drink with New Zealanders, whose coffee consumption is on par with that of Americans.)

But good coffee is more about quality than quantity, is it not? Though the US is the birthplace of Starbucks, the most

thoughtstacks.com/m/#h







Pangaro | February 2022

Streamfully mobile

UI design & coding by John Katagawa

UX & heuristics by Paul Pangaro

Designing for Conversation 7. #NewMacy Initiative

Graduate Graphic Design Studio II — NC State February 2022

pangaro.com/ncsu2022

Analogic Frameworks — Alternatives to Today's Al

DATA-ANIMATED

binary

discrete

deterministic

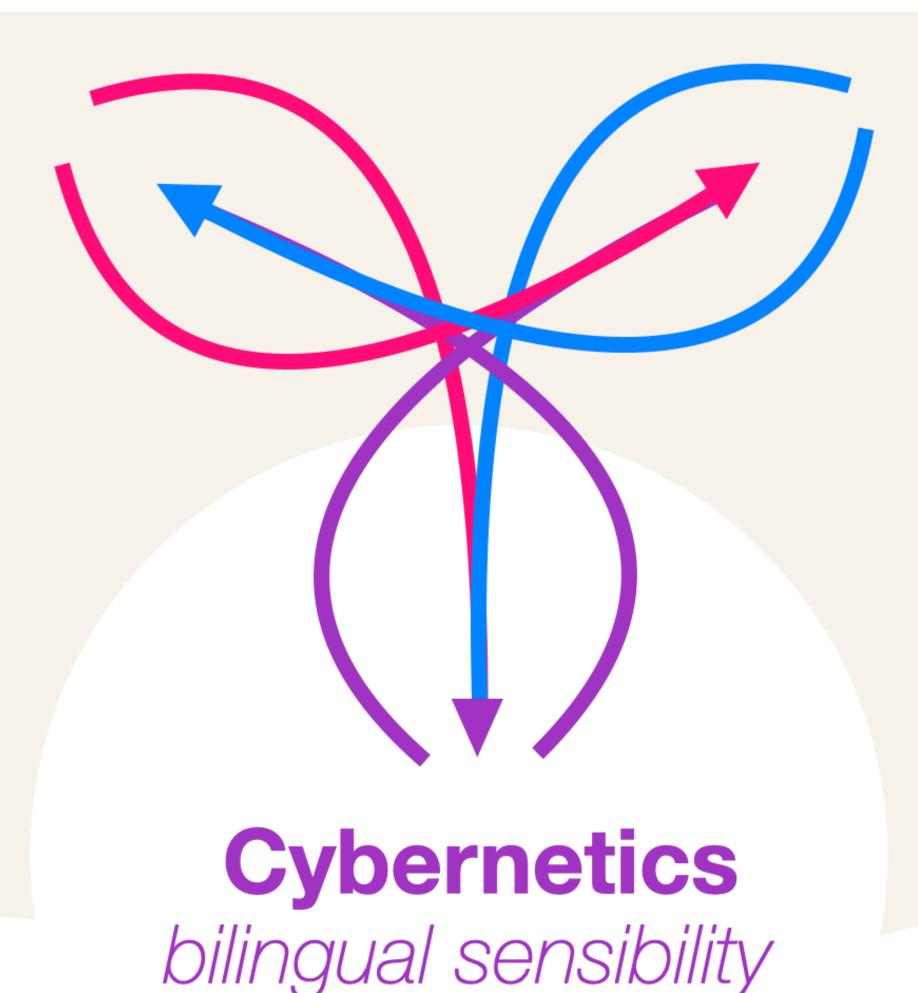
artificial

representational

specific

predictive

transactional



SOCIALLY-ANIMATED

biological

fluid

open-ended

organic

resonant

ambiguous

uncertain

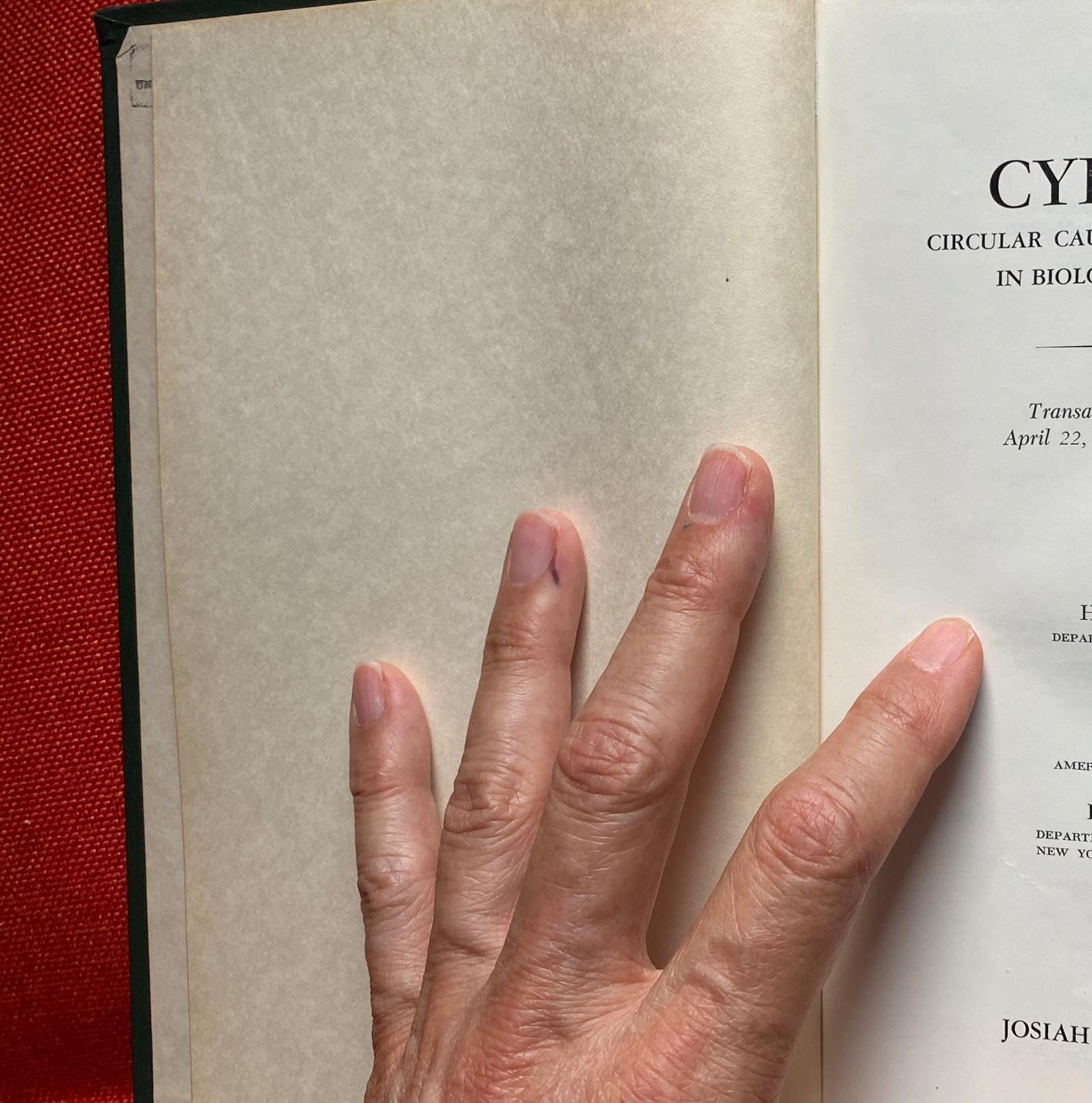
conversational

Digital

Analog

Bringing about a preferred future Novelty, transparency, and choice in IxD

Our goal is to design and integrate new classes of interactional systems with today's Al and digital technologies to create and promote a new category of analog interactional frameworks.



CYBERNETICS

CIRCULAR CAUSAL AND FEEDBACK MECHANISMS
IN BIOLOGICAL AND SOCIAL SYSTEMS

Transactions of the Tenth Conference April 22, 23, and 24, 1953, Princeton, N. J.

Edited by HEINZ VON FOERSTER

DEPARTMENT OF ELECTRICAL ENGINEERING UNIVERSITY OF ILLINOIS CHAMPAIGN, ILL.

Assistant Editors MARGARET MEAD

AMERICAN MUSEUM OF NATURAL HISTORY NEW YORK, N. Y.

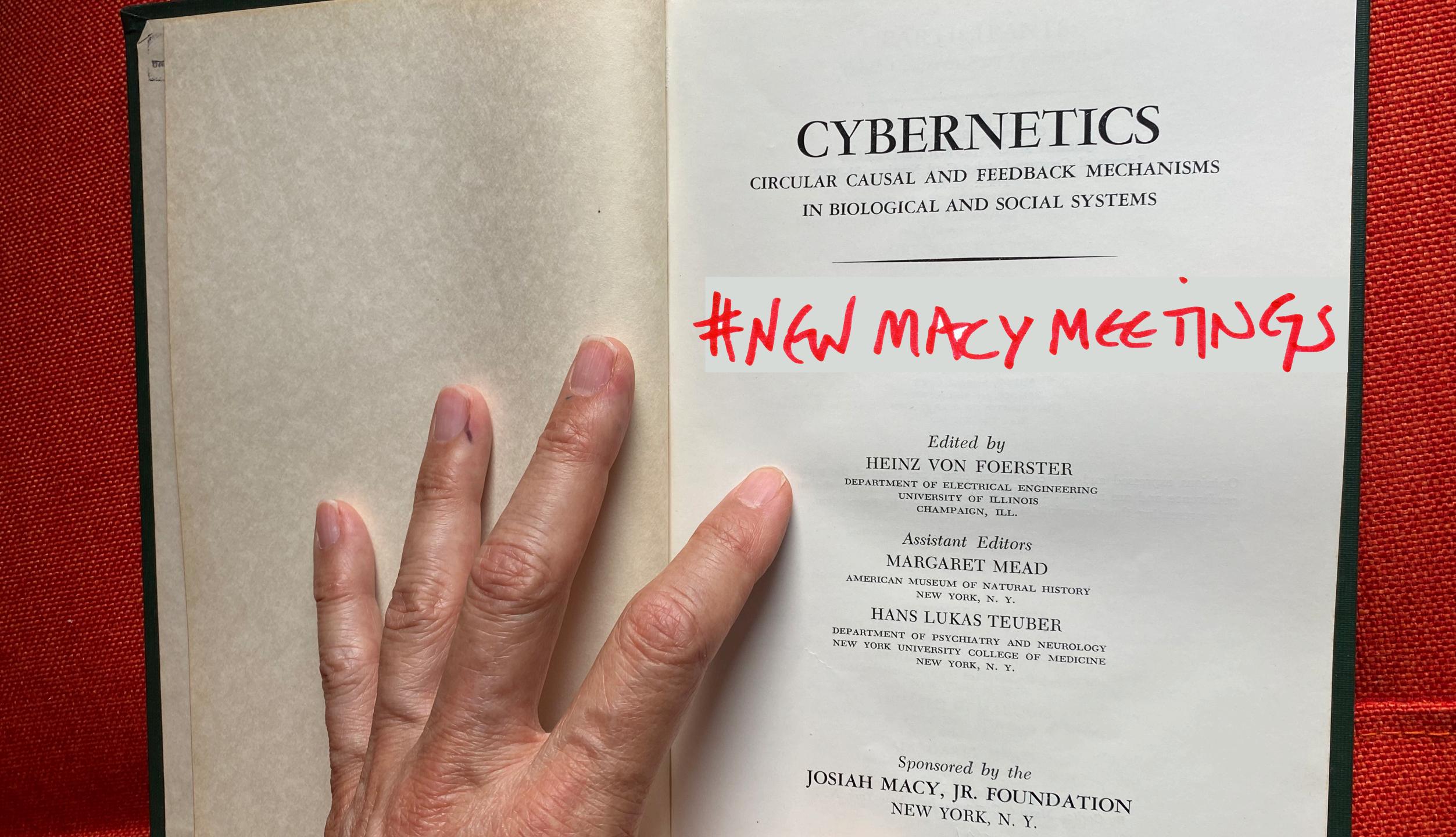
HANS LUKAS TEUBER

DEPARTMENT OF PSYCHIATRY AND NEUROLOGY NEW YORK UNIVERSITY COLLEGE OF MEDICINE NEW YORK, N. Y.

Sponsored by the

JOSIAH MACY, JR. FOUNDATION

NEW YORK, N. Y.



Theme 1. Bringing about a preferred future #NewMacy in the 21st Century

Create and promote analog interactional frameworks

- a. Identify types of algorithms and contexts where Al is now influential
- b. Bring in participation across domains and communities
- c. Establish a new paradigm of analog interactional systems
- d. Collect existing systems and code new ones, across art and tech
- e. Disseminate to designers, students, teachers, entrepreneurs...

#NewMacy Initiative

Click for Blog post



#NewMacy Network + #NewMacy Meetings #NewMacy in the 21st Century

Let us bring about a rich mesh of collaborations among individuals and organizations—across disciplines, geographies, and generations.

We will be deliberate about what we wish to conserve as analog, biological, social beings—and then use technology to serve our principles.

We are excited to see what can emerge.

Please join us.



Presentation Conversation Imparts Agency to Human-Machine Interaction

Thank you.

Special thanks to:

Helen Armstrong Karen Kornblum

Paul Pangaro

ppangaro@cmu.edu

@NewMacyMeetings

pangaro.com/ncsu2020/

Links

Responding to Pandemics of "Today's Al"

#NewMacy-Related Links

Cybernetics, AI, and Ethical Conversations

Presentation Conversation Imparts Agency to Human-Machine Interaction

Appendix

Paul Pangaro

ppangaro@cmu.edu

@NewMacyMeetings

pangaro.com/ncsu2020/

"Moreover, if we move in the direction of making machines which learn and whose behavior is modified by experience, we must face the fact that every degree of independence we give the machine is a degree of possible defiance of our wishes."

-Norbert Wiener 1949

Cybernetics Neural Nets Al

| McCulloch-Pitts neurons |
|------------------------------|
| Macy Meetings on Circularity |
| Cybernetics by Wiener |

1943 1946-1953 1948

- "Neural Nets" are born

- swarms the Zeitgeist

- influences generations

Dartmouth Al Conference
Symbolic Al rises
Perceptrons kills neural nets
Cybernetics languishes

1956 1956-1980 1969 1956-2010

- contra Cybernetics

- Al swarms the zeitgeist

- Minsky denies von Foerster

- Al influences generations

Hinton brings back neural nets Internet brings Big Data "Surveillance Capitalism" 1980s 2000s 2000s-2020s

- Expert Systems come & go

- NN swarm the Zeitgeist

2000s-2020s - "Wicked Problems" prevail

Cybernetics + Macy Meetings

In the 1940s and 1950s, a series of small conferences were funded by the Josiah Macy Jr Foundation.

Experts from a vast range of disciplines focused on PUIPOSE in understanding and designing complex systems. They created a new way of thinking and acting in the world and started a revolution.

They called this new field Cybernetics from a Greek word meaning the art of steering toward a goal—acting with purpose.

These original Macy Meetings changed the worlds of science, engineering, and humanities.

Cybernetics + Macy Meetings

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These original Macy Meetings changed the worlds of science, engineering, and humanities. We need such a revolution again to tame today's "wicked problems"—#NewMacy Meetings.

Antidotes to "Bad Al": Responding to the Pandemic of "Todays Al"

Rationale

- Digital culture contributes to the Pandemic of "Today's Al."
- Human experiences of interaction, information, and intelligence are compromised.
- Analog interactional frameworks can be organic, conversational, and humane.
- Cybernetics offers bilingual sensibility to bridge the analog & the digital.
- Promoting new design patterns & working prototypes can bring positive change.
- Urgency of the need and scale of the challenge requires that we convene #NewMacy Conversations in a Network of #NewMacy Meetings.

Cybernetics & Macy Meetings

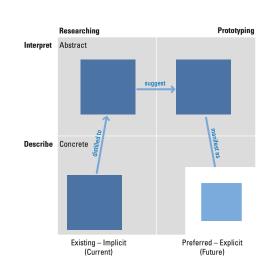
Original Macy Meetings 1943 – 1955

- post-WWII "world order"
- digital rising
- circular causal & feedback mechanisms
- closed selection of participants
- transdisciplinary

#NewMacy Meetings 2020 –

- post-COVID "wicked problems"
- digital supreme
- ... + socio-technical entanglements
- open network of collaborators
- transdisciplinary transglobal transgenerational

Bringing about a preferred future #NewMacy in the 21st Century



Create and promote analog interactional frameworks

- a. Identify participants & examples
 - find current examples
 - characterize their qualities
 - fan out to find related efforts
 - develop database
 - share openly and seek critique
- b. Characterize contexts where Al is now influential or prevalent
 - gather types of Al algorithms
 - · deconstruct search, recommenders, social...
 - build models of today's Al algorithmic types
 - share openly and seek critique

- c. Establish a new paradigm of analog interactional systems
 - match Al contexts to new frameworks
 - prioritize for impact & importance
 - gather experts to evolve the frameworks
 - share openly and seek critique
 - produce and distribute outcomes as design patterns, toolkits, and workshops

d. Code new systems & disseminate

- prototype these alternatives as open source
- critique with sociologists, economists, MBAs...
- add to curricula for designers, coders...

#NewMacy Conversations

Summary of activities

- Launched at <u>Seminar</u> at Carnegie Mellon, March 2020
- On-going conversations in association with the American Society for Cybernetics, from April 2020
- Cybernetics and Designing for Action, September 2020
- #NewMacy Meeting Experiment #1, September 2020
- Presentation at AlAgora at TU Delft, December 2020
- Manifesto document, March 2021
- Responding to the Pandemic of "Today's Al" evolving draft
- **MewMacy Meeting #2: "Urgent Questions" in response to "Today's AI", ASC Series Event, September 2021
- #NewMacy Meeting #3, October 2021
- #NewMacy at RSD10, November 2021

What's next

- Advancing the plan to respond to Today's Al
- Developing Principles & Themes
- Designing for variety in #NewMacy Conversations
- Reaching GenZ (18 to 25 year-olds) to represent their worldview and values on upcoming generations
- Seeking #NewMacy Network organizations
- Seeking #NewMacy Network individual participants
- Continuing to build #NewMacy Advisory Council

#NewMacy Advisory Council

Confirmed Members

- Philip Beesley / U of Waterloo Toronto
- Hugh Dubberly / San Francisco
- Omar Kahn / Carnegie Mellon USA
- Guilherme Kujawski / São Paolo
- Deborah Forster / USA
- Innocent Ndubuisi-Obi, Jr / USA

- Nga Nguyen / New York
- Despina Papadopoulos / New York
- Andy Pickering / UK
- Bernard Scott / UK
- Delia Pembrey MacNamara / Australia
- Renee V. Wallace / Detroit

More to follow

We believe cybernetics offers a foundation for 21st-century design practice, with this rationale:

— Dubberly & Pangaro, "Cybernetics and Design: Conversations for Action", 2019

- The prominence of digital technology in daily life cannot be denied (or reversed). Digital technology comprises systems of systems (Internet of Things).
- Design has expanded from **giving-form** to **creating systems** that support interactions. Human interactions span thinking and acting, whether mundane or metaphysical.

136

We must model and tame this complex mesh of mechanisms.

Therefore: systems literacy is a necessary foundation for design.

If systems, then cybernetics:

- Digital interactions comprise reliable connections, communication, and feedback.
 Human interactions comprise purpose, feedback, and learning.
- The science of communication and feedback, interaction and purpose, is cybernetics.

We must model communication and intention in a common frame.

Therefore: cybernetics is a necessary foundation for design.

If systems, then cybernetics.

If cybernetics, then second-order cybernetics:

- Framing "wicked challenges" requires articulating human values and viewpoints.
 Values and viewpoints are subjective.
- Designers must offer a persuasive rationale for our subjective viewpoints.
- Modeling subjectivity is the province of second-order cybernetics.

We must embrace values and subjectivity at the heart of designing.

Therefore: second-order cybernetics is a necessary foundation for design.

If systems, then cybernetics.

If cybernetics, then second-order cybernetics.

If second-order cybernetics, then conversation:

- Taming "wicked challenges" must be grounded in argumentation.
- Argumentation requires conversation so that participants may understand and agree.
- Agreement is necessary for collaboration and effective action.

We must embrace argumentation and collaboration to the heart of 21st-century design.

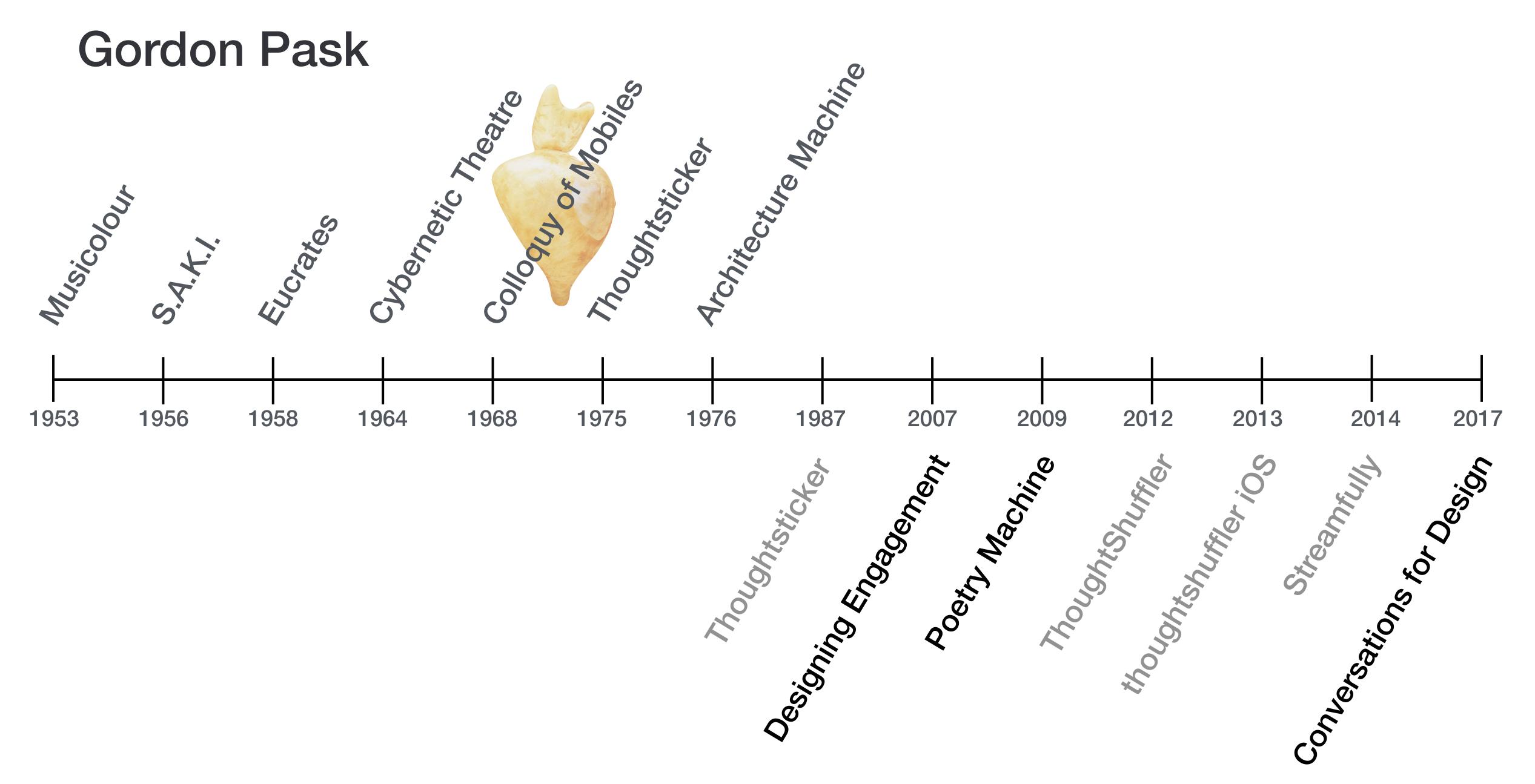
Therefore: conversation is a necessary foundation for design.

If systems, then cybernetics.

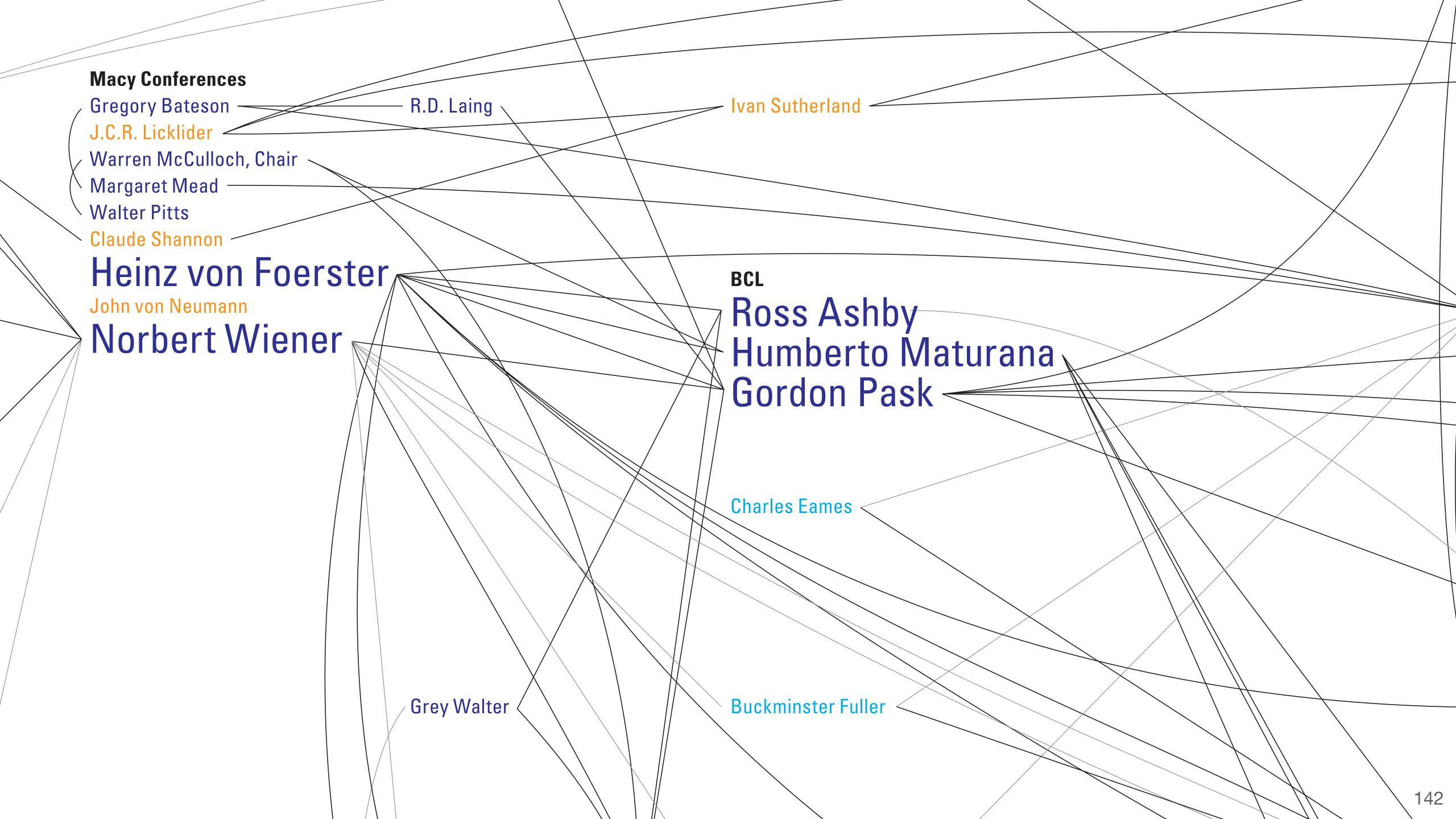
If cybernetics, then second-order cybernetics.

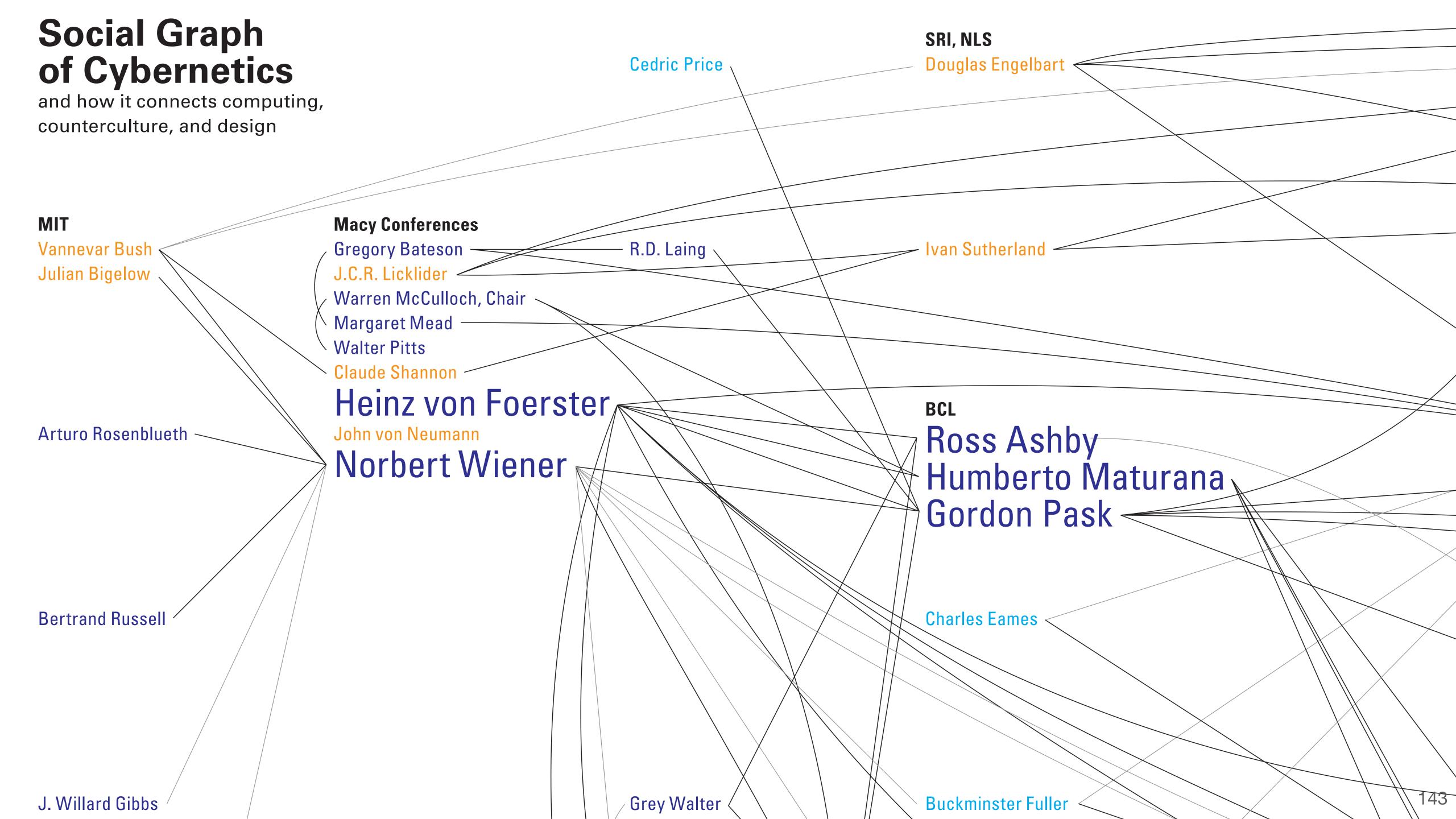
If second-order cybernetics, then conversation.

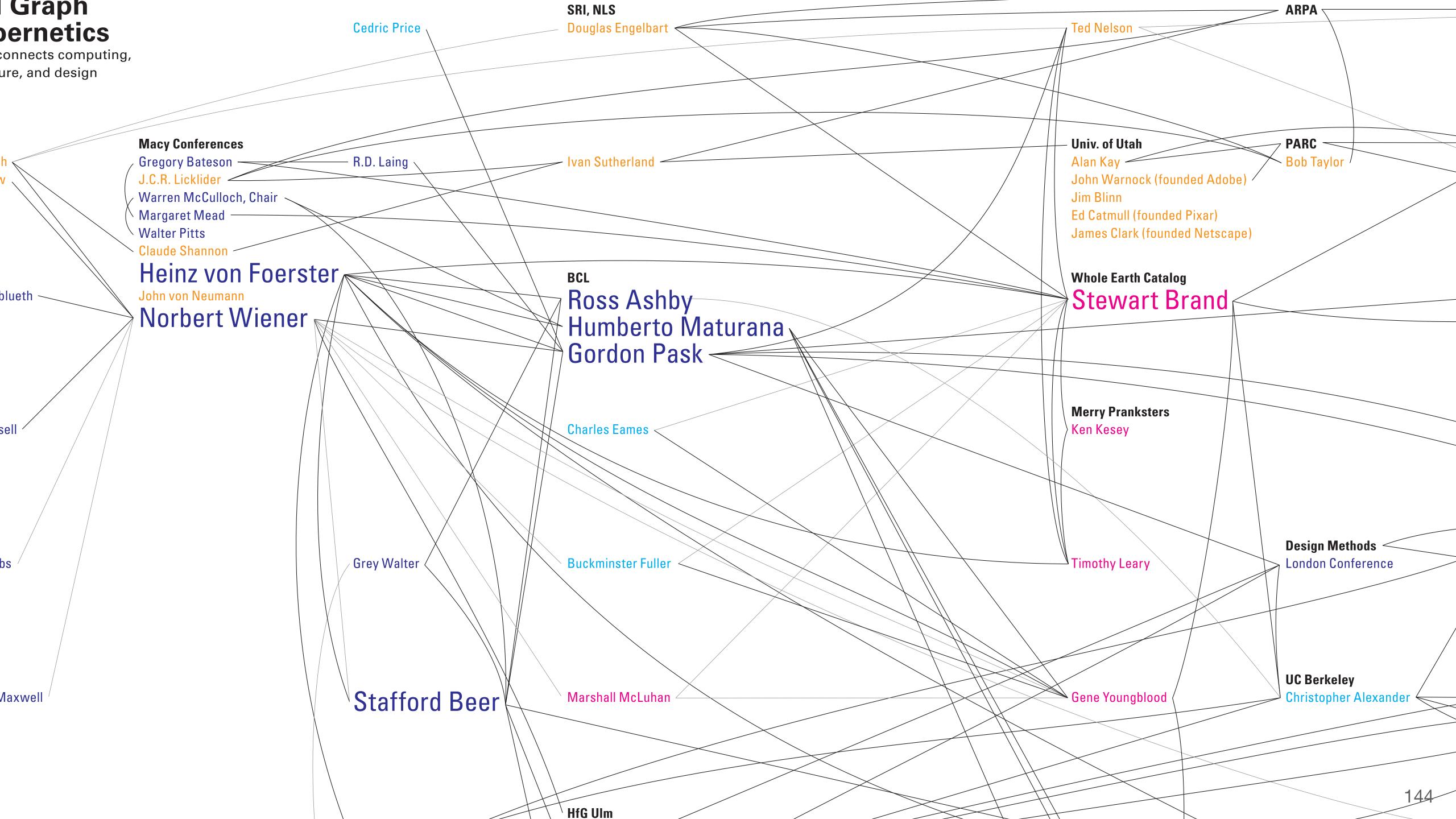
— Dubberly & Pangaro, "Cybernetics and Design: Conversations for Action", 2019

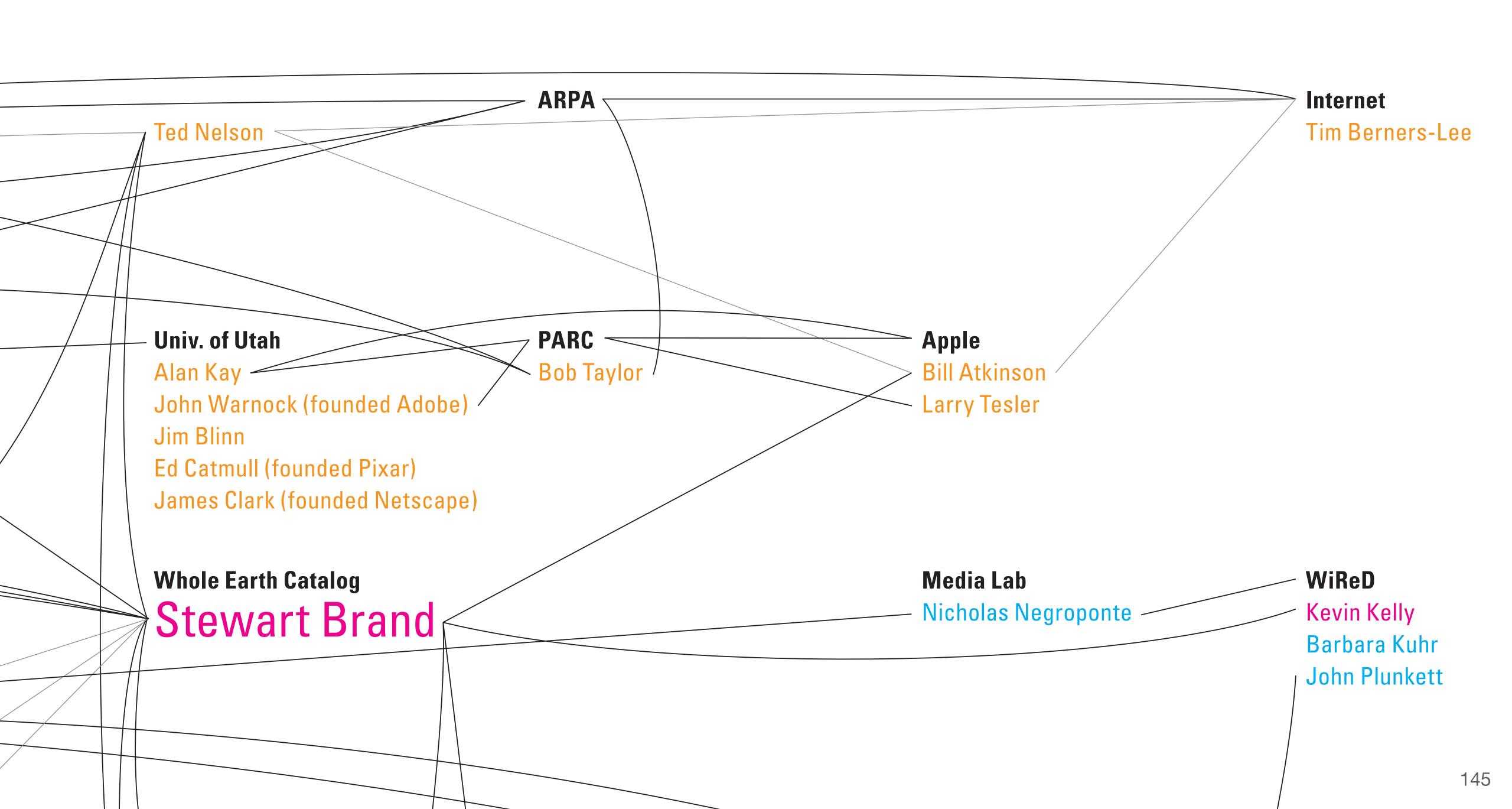


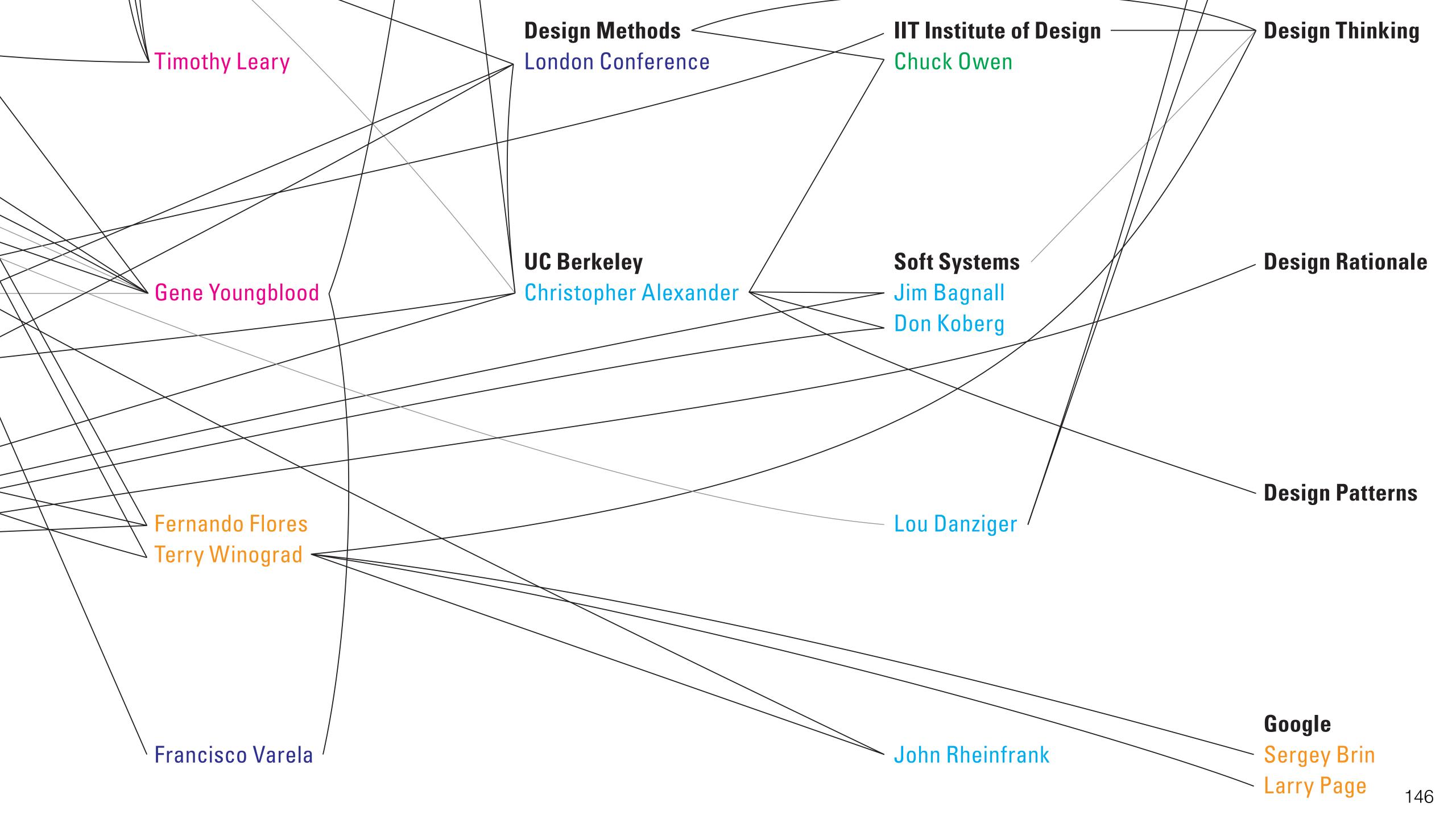
Pangaro | LASG Symposium | March 2019

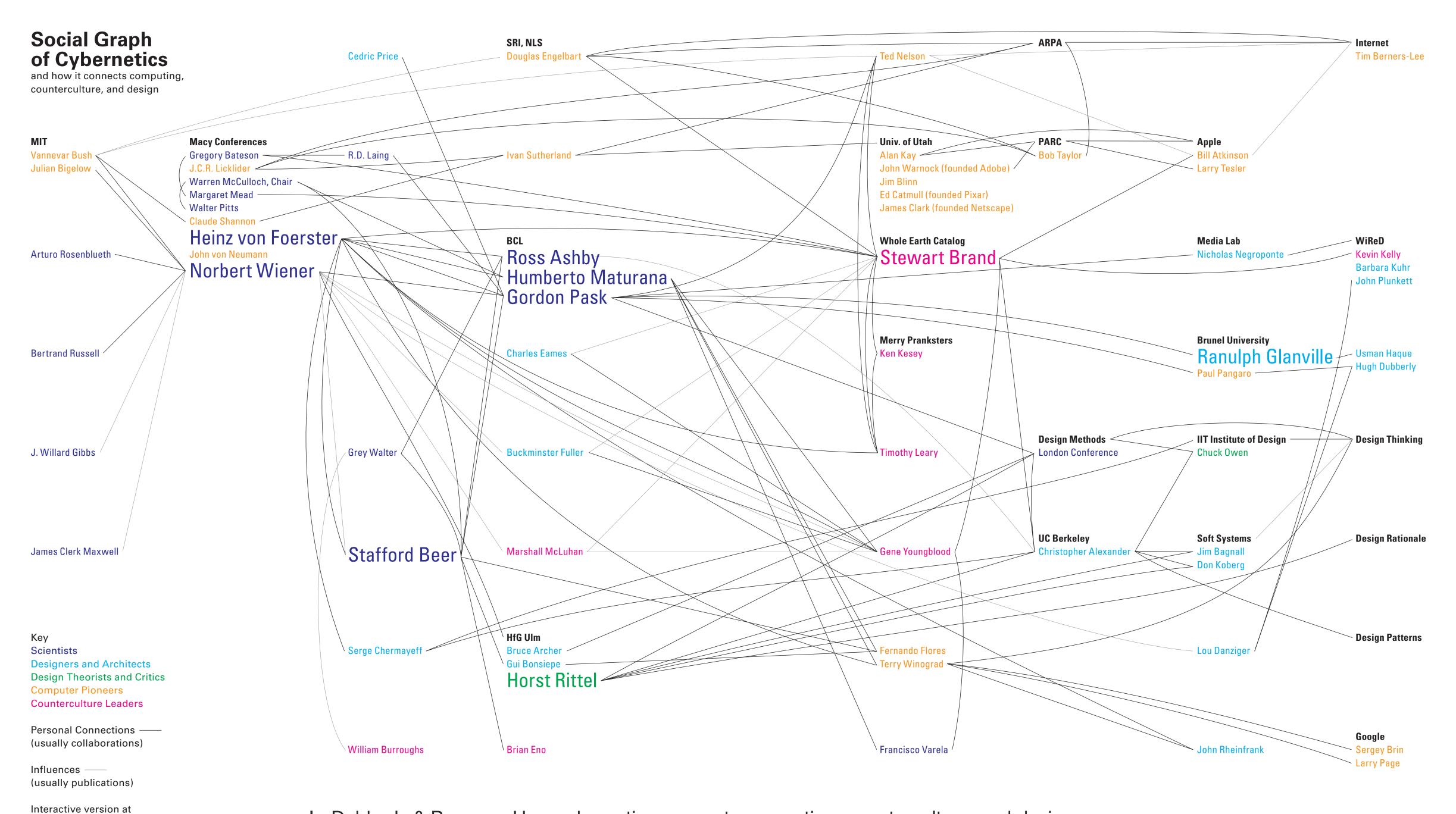












http://cybergraph.dubberly.com/

"As a designer, I shall act always so as to increase the total number of choices for a user."*

Paul Pangaro ppangaro@cmu.edu

* adapted from von Foerster's "ethical imperative", see "Ethics and Second-order Cybernetics" 1991, p287